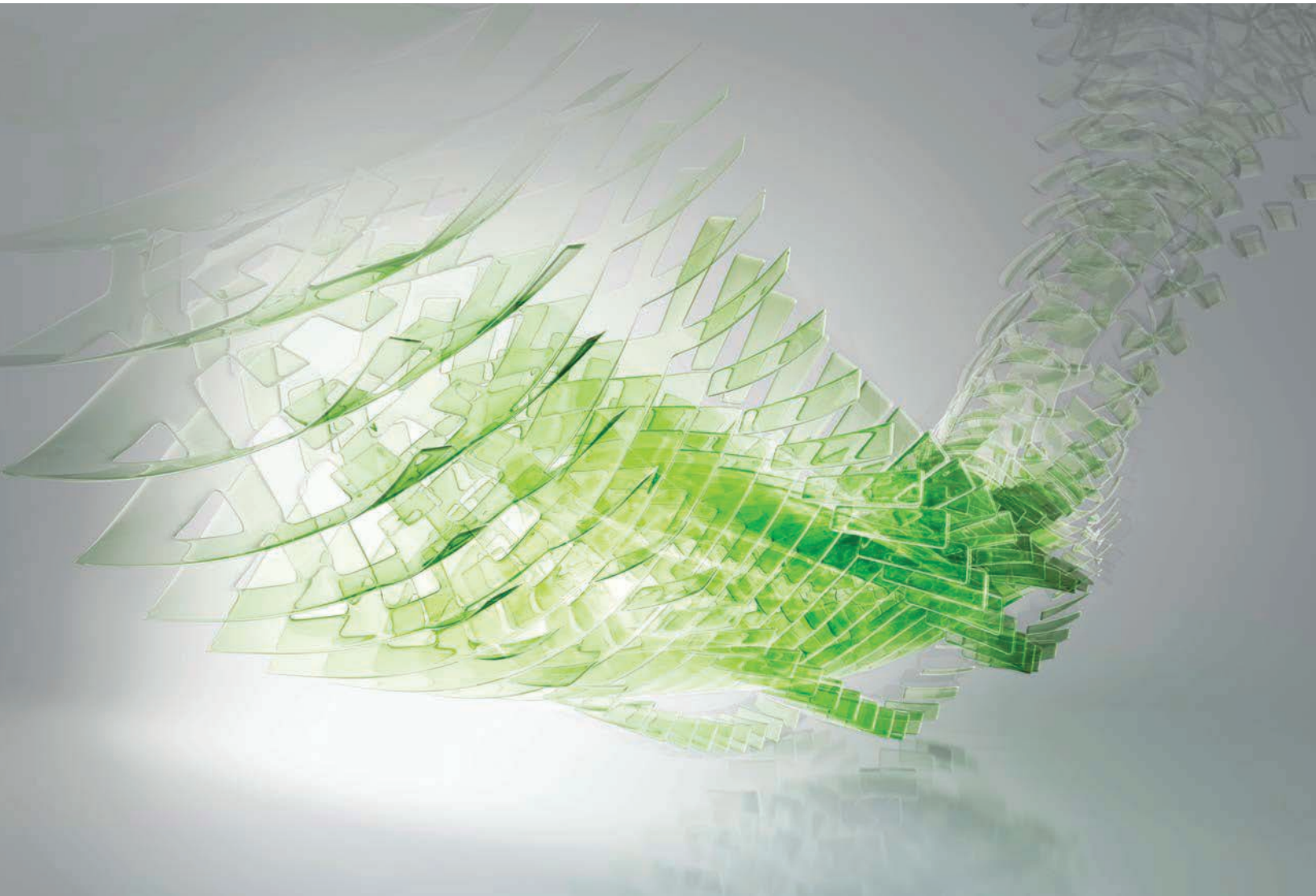




AUTODESK®
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User Guide

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New in Lustre 2018

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BrowseD

- The BrowseD service is being retired and is no longer available in Lustre 2018 and above.

Media Import

- It is now possible to import 32-bit float media through Wiretap Gateway, Wiretap server, and locally. However, the media is converted to 16-bit float on import.
 - Media Import: OpenEXR (including Multi-Channel).
 - Wiretap Interchange: 32-bit media and sequences loaded from Flame through the Source Grading workflow are converted to 16-bit float on import in Lustre and returned to Flame as 16-bit float media. Sequences are flagged as 32-bit float.
- The Connected Colour Workflow clamps the Lustre and Read File nodes to 16-bit float.

Colour Management

- The Colour Management View transform mode set on a clip in Flame is preserved in Lustre, however it cannot be edited.
- A Timeline, imported via the wiretap server, that contains a clip with a view transform mode, has its UI disabled in Lustre to protect it from editing. The transform is applied in the player, but you cannot edit it. The only way to modify it is by copying another colour management mode using the selector, or by loading a transcode template.
- The library and the browser display information this information accurately. This means that if we transcode or render a clip that has a view transform, the destination clip is tagged with this colour space.
- When the 'From File or Rules' option is selected, the content's colour space is automatically assigned and a message is displayed, detailing the mapped colour space.
- The Colour Transform plugin is now capable of reading all LUT and Colour Transform file formats supported by Autodesk Colour Management.

Project Management

- Project and User creation in a standalone Lustre 2018 installation is streamlined with the Flame Premium configuration. The Projects and Users are created and stored in the same file location as Flame Premium. This change implies that if you are using a pre 2018 standalone Lustre installation, you must modify the init.cfg file of the 2018 Standalone Lustre so that the 'MainProjectHome' and 'MainUserHome' file paths point to the same location as the previous configuration, in order to be able to work with those Projects and Users.

Playback

- New Low Latency playback mode (without audio), which removes the delay between DVI and SDI (AJA SDI Preview only). ALT+click the SDI button to enable this mode.

Miscellaneous Enhancements

- Better interactivity with multiple secondaries when using Lustre Reactor GPU caching in the GPU pipeline. This enhances:
 - Keyer
 - Shapes
 - Plugins
 - Stereo 3D
- Copying the lock state of a tool no longer copies the parameters of the tool.
- Toggling Secondaries On and Off now sets the Change Flag.
- Rendering Dust Busting data on 16-bit float media with Crop enabled no longer results in file corruption.
- Rendering 16-bit float media with Burn (CPU) no longer results in file corruption.
- Collapsing a cut no longer deselects the Secondary Matte track.
- More robust playback synchronization when working with Stereo 3D and using AJA Kona for SDI monitoring.

Lustre Workflow

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workflows:Lustre generalIt is a good idea to read this chapter thoroughly to understand how the workflow of a typical colour grading project corresponds to working in Lustre. The first section in this chapter describes the image processing order—the order in which modifications are applied to a shot. Each subsequent section summarizes a significant stage in a colour grading project and provides cross-references to sections containing procedural information.

This workflow is presented as a linear process. However, due to the flexibility and unpredictability of the creative process, it is unlikely that you will go through the stages in the order presented—often different stages are worked on simultaneously and some stages are revisited several times.

Image Processing Pipeline

processing, image pipeline orderworkflows:processing pipelineIn Lustre, image processing order is pre-determined—the order in which you perform image processing tasks does not change the order in which they are processed. You can perform these tasks on different stations simultaneously and get the same results. For example, if you apply an input LUT to a shot from a Lustre Station, it will be processed before the colour grading effects created on the Master Station are processed, regardless of the order in which you apply them.

Colour grading may occur at the beginning, the end, or the beginning and end of the post-production process. In Lustre, the order in which you create image processing effects parallels the different stages in the post-production process. Each task corresponds to a menu.

The image processing is as follows:

- 1 The application of a CDL from the CDL menu.
- 2 The application of input LUTs from the Input LUT menu.
- 3 Initial primary colour grading from the Grading menu (with the Input button enabled).
- 4 RGB and Hue curves colour grading from the Curves menu.
- 5 Secondary colour grading from the Secondaries menu.
- 6 Sparks® plugin effects from the Effects menu.
- 7 RGB curves colour grading from the Curves menu.
- 8 Final primary colour grading from the Primary menu (with the Output button enabled).
- 9 The application of output LUTs from the Render | Output menu.

NOTE Dust removal operations are processed separately. Shots where artefacts have been removed are not updated in other menus until you render.

Setting Up Users and Projects

At the beginning of every project, you specify the location of your footage, set up user profiles, the project, project parameters (such as logarithmic or linear colour space), and the scenes that contain the reel or scene footage that you are going to work on. During each session, you then select a user profile and project so that you can save metadata for your grades. See [Project Management](#) (page 45).

Monitor Calibration

At the beginning of a project, and throughout, you should calibrate the monitors for all stations to ensure the proper display of your footage. Calibrate the monitors according to the colour space (logarithmic or linear) and footage you are using. See [Calibration and Working Space](#) (page 179).

Applying Print LUTs

For film print simulation, you can apply Print LUTs, which are updated regularly by your film lab. See [Applying LUTs for Viewing \(Print LUTs\)](#) (page 188).

Editing

Once you store your media and resources into the appropriate directories, you can edit the footage to the timeline in preparation for colour grading. Procedures for editing footage may include:

- Browsing footage and bringing it to the timeline. See [Loading Clips to the Library](#) (page 212).
- Assembling EDLs in the timeline. See [Working with EDL, ALE, and Cutlist Files](#) (page 233).
- Editing shots in a multi-layer Timeline. See [Editing in the Timeline](#) (page 281).
- Capturing footage from a VTR. See [Capturing Material](#) (page 646).
- Performing basic gestural edits such as trimming, slipping, and sliding shots, as well as creating dissolves. See [Editing](#) (page 257).

Rendering Proxies

For projects that use large files (such as 2K Cineon® files), you should render half-resolution (1K) proxies of all the shots in the timeline before you begin colour grading. Proxies are used to reduce processing time when interaction is slow, such as when you apply several secondaries to a shot. See [Generating and Viewing Proxies](#) (page 603).

Removing Dust

You can remove dust and other artefacts from your shots at any time in the project workflow. However, it is recommended that you remove dust early in the project so that the colourist can work with clean shots and you have time to do more than one dust removal pass on the footage.

Dust removal metadata is saved separately from other colour grading data. This makes it possible to remove dust on Lustre Stations while developing the colour grade on the Master Station. The same applies if using more than one Lustre HD Station. You can then replace dusty shots with clean ones without affecting the colour grade. See [Removing Dust](#) (page 347).

Repositioning Shots

Once your footage is organized in the timeline, you can reposition shots that need the viewable area adjusted. For example, reposition shots that come from a wide-screen film format and are going to video. See [Repositioning Images](#) (page 369).

Applying Input LUTs

With your footage organized and prepared for creative work, you are ready to apply any necessary input LUTs before you begin colour grading. Apply an input LUT to a shot when you need to remap colour values in the entire shot. Procedures for applying input LUTs include:

- Applying an existing input LUT to create a particular look (such as a KODAK™ film stock look). See [Applying an Existing Input LUT](#) (page 383).
- Creating an input LUT to convert logarithmic data to linear data when working with film footage in Linear mode. See [Linear Mode: Creating Conversion LUTs](#) (page 385).

Colour Grading

Lustre is primarily a colour grading application. Project setup, editing, and basic image processing are all procedures that you perform in preparation for creating a convincing colour grade.

Colour grading procedures include:

- Performing primary colour grading to change the overall colour look of each shot used in a series of shots, scene, or entire project. See [Primary Colour Grading](#) (page 415).
- Modifying RGB and Hue curves to colour grade specific ranges of colour without using keys. See [Colour Grading Secondaries](#) (page 448).
- Performing secondary colour grading to specific ranges of colour or areas in an image through keys and geometries. See [Colour Grading Secondaries](#) (page 448).
- Generating keys for secondary colour grading. See [Creating a Secondary by Keying a Range of Colours](#) (page 477).
- Creating and tracking geometries for secondary colour grading. See [About Geometries](#) (page 451) and [Animating the Point Tracker](#) (page 506).

Using Sparks

While colour grading your shots, you can load Autodesk Sparks® plugins to create additional image processing effects such as a blur or a glow. Sparks are applied on a shot-by-shot basis. See [Creating Lustre Sparks Effects](#) (page 525).

Animating Colour Effects

At various times, you may want to animate a colour grading parameter to enhance the colour look, ambience, or to make a static shot more dynamic. You can animate most parameters using the Animation controls. See [Animation](#) (page 541).

Outputting the Result

At the end of a project, you output the final version of your grade. You may also want to output your grade in the middle of a project to preview the colour grade or show it to your client. Outputting procedures may include:

- Applying a Log to Lin conversion LUT. See [Setting Colour Space Options](#) (page 602).
- Rendering a print of the final grade. See [Rendering](#) (page 591).
- Outputting rendered files to a VTR or any other device. See [Playing Out to a VTR](#) (page 662).

Interoperability Workflows in Lustre

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Interoperability allows for Creative Finishing applications, on the same or on different workstations, to share clips and sequences (timelines).

To obtain a sequence, the Lustre artist simply browses the remote project's project folders, and drags and drops the Smoke/Flame sequence to the Lustre Storyboard. Grading proceeds as usual. Once done, Lustre renders its results back to the project's defined render destination (i.e Lustre Shared Library or any location on the Media List). Within the context of Source Grading, this process leaves all Timeline FX, transitions and metadata intact.

Conceptually, this is the simplest scenario. However, the interoperability features give you a high level of flexibility, whereas you can send your sequence to and back from any of the Creative Finishing applications at any point of the finishing process.

About Source Grading and Sequence Grading

There are two ways you can use Autodesk Lustre to grade media coming from Autodesk Smoke and Autodesk Flame, depending on the project you're working on and the requirements of your facility:

- You may want to work in parallel of the editorial process and grade the sources as the editorial decisions are being made (Source Grading).
- You may want to perform the colour grading at the end of your project, once the online editing, visual effects and titling are complete (Sequence Grading).

Source Grading Workflow

- 1 Assemble your sequence in Smoke/Flame.
- 2 Save your sequence to the Lustre shared Library.
- 3 Import your sequence into Lustre, with the Source Grading option enabled. Your multilayer sequence is imported into Lustre and the source media is displayed. You can grade your sources in context, taking into account the editorial decisions to date.
- 4 Grade your sequence sources.
- 5 Render the graded sequence in Lustre.
- 6 Open the graded sequence in Smoke/Flame for further enhancements.

Sequence Grading Workflow

- 1 Assemble your sequence in Smoke/Flame.
- 2 Render your sequence in Smoke/Flame and save it to the Lustre Shared Library.

- 3 Import your sequence into Lustre, with the Source Grading option disabled. Your multilayer sequence is imported into Lustre and all effects and unsupported transitions are committed.
- 4 Grade your sequence.
- 5 Render the graded sequence in Lustre.
- 6 Import the rendered sequence into Smoke/Flame or export the final media from Lustre.

Basic Interoperability Workflow

The setup of your interoperability project depends on whether you have Smoke/Flame and Lustre installed on separate workstations or whether you have them installed on the same workstation, as in Flame Premium.

To set up an interoperability project on standalone Smoke/Flame and Lustre workstations:

- 1 Create your projects in Smoke/Flame and Lustre.
- 2 Set your Scans and Renders paths in Lustre to correspond with your Smoke/Flame projects.

See:

[Project Menu Settings](#) (page 710)

[Setting Up the Lustre Wiretap Project](#) (page 710)

To set up an interoperability project with Smoke/Flame and Lustre on the same workstation, as in Flame Premium:

- 1 Create your project in Flame Premium as usual.

Smoke/Flame create a Lustre project and a shared library named Lustre in your project that Lustre renders back to by default.

NOTE Creating a Flame Premium project automatically creates a Lustre project. However, creating a Lustre project does not create a Flame Premium project.

Important Source Grading Considerations

To use the interoperability features between different Creative Finishing applications and workstations, you must be running the same version of Wiretap Server on each workstation.

File Path Translation

File path translation ensures that different workstations running different operating systems are able to convert file paths from other operating systems to a file path in their native file structure. This ensures compatibility between Linux, Mac OSX and Windows workstations in a collaborative workflow, as the different workstations send and receive commands to exchange media to and from shared storage.

Shared Storage in a Workgroup Environment

Before performing finishing and grading in a shared project from multiple workstations, using a shared storage (NAS/SAN), you must configure the following files:

- **Init.config:** located in: /usr/autodesk/lusterpremium_2013.1/
- **wiretap_path_translation_db.xml:** located in: /opt/Autodesk/wiretap/current/cfg/

Init.config

To make sure Lustre is able to read media files from its direct connection to a shared storage, you must edit the PathTranslationTable portion of the init.config file, as follows:

```
<PathTranslationTable>
<PathTranslation src="172.16.129.101@wtg:/Volumes/QASAN01"
dst="localhost@wtg:/QASAN01"/>
```

This example translates a Mac Wiretap Gateway mountpoint to its corresponding Linux Lustre mountpoint, which allows Lustre to read the media from its own storage mount point, rather than from the remote workstation.

wiretap_path_translation_db.xml

It is possible to render media files on a shared storage and write the sequence and clips metadata in the Smoke / Flame Premium Media Library or Shared Folder (Wiretap Render). If the shared volume does not have the same mount point on the two workstations, you must add the corresponding mount points to the wiretap_path_translation_db.xml file, as follows:

Add the corresponding mount points:

```
<map src_os="Linux" src_path="/QASAN01" dst_os="MacOSX" dst_path="/Volumes/QASAN01"
/>
<map src_os="MacOSX" src_path="/Volumes/QASAN01" dst_os="Linux" dst_path="/QASAN01"
/>
```

Save the file and restart Stone+Wire

Performing a Wiretap render writes the files and the generated clips and sequence(s) that will reference the translated path.

NOTE

- Lustre is able to read & write to any folder in a Workspace that is not Read-Only.
- Flame Premium Batch Snapshots cannot be accessed in Lustre.

Compressed Intermediates

Lustre can read & write compressed intermediates from a Flame Family project (i.e. Apple QuickTime ProRes and Avid DNxHD). However, for collaborative workflows in which multiple workstations are connected over a high speed network and/or Shared Storage (SAN), there is a limitation to the media access, in that compressed intermediates are not directly read from the Shared Storage but from the Wiretap Server network connection. For example, two workstations connected to a SAN can share media, but compressed intermediates will not be read directly from the shared storage on the Lustre station since Lustre does not natively support Apple QuickTime or DNxHD). To get around this, do the following:

- First, make sure Wiretap server network interface is defined using InfiniBand or 10-GiE. By default, the wiretap configuration file defines the house network but for SD/HD and higher resolution workflows, it is better to use the fastest network connection available. Make sure to always restart the Wiretap server after modifying the configuration file.
- Create your content through a Remote Connection (this requires the presence of Flame, Flame Assist or Flare on the Lustre workstation): By selecting the Lustre workstation, from the Host Computer drop-down menu, when you start your project, you can use Flame or Flame Assist for conform and sequence preparation for media that will ultimately end up in Lustre. By generating the media for grading using Compressed Intermediates on the Lustre workstation, Lustre sees the media as local and playback performance is good. This is the ideal workflow for high resolution work (HD, Film, UHD TV, etc).

NOTE Due to a limitation, OpenEXR intermediates have the same behavior so using either a Publish (with link) workflow or a Remote Connection is the recommended workflow for these collaboration cases.

BatchFXConnectFX

You must render BatchFXConnectFX segments and BatchFXConnectFX on gaps prior to importing the sequence into Lustre.

- Rendered effects are seen as source media by Lustre and can be graded along with the rest of the sources.
- Unrendered BatchFXConnectFX are displayed as black frames in Lustre.

NOTE Rendered BatchFXConnectFX segments in Lustre do not display the BatchFXConnectFX icon. And the BatchFXConnectFX icon is not displayed on the BatchFXConnectFX timeline segments in Smoke/Flame after being rendered in Lustre.

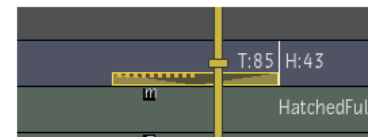
Transitions

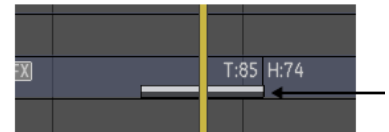
All transitions are preserved by Lustre.

- Only dissolves (with or without animation) are displayed.
- Action and Wipe transitions are displayed as dissolves. The original Wipe/Action transitions are preserved in Lustre and are recreated in Smoke/Flame upon reimport. A special icon is displayed in the timeline in Lustre whenever Action and Wipe transitions occur.



Action Transition in Smoke/Flame (Image courtesy of EVN PRODUCTIONS)





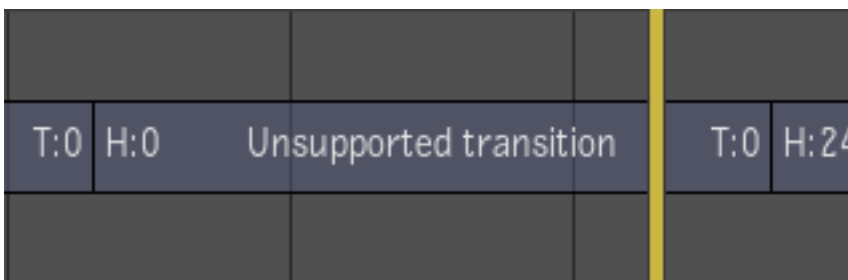
Action Transition displayed as a dissolve in Lustre (Image courtesy of EVN Productions)

Custom Transitions

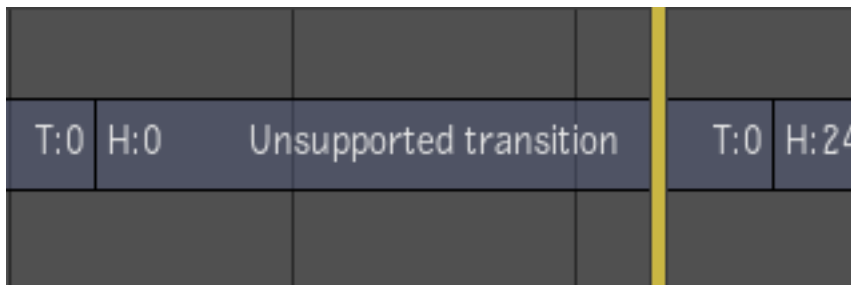
Custom transitions are rendered media and appear as a clip in Lustre. This clip is maintained in Smoke/Flame when you reload the sequence after it is rendered in Lustre. It is recommended to create your custom transitions after the source media has been graded and replaced in Smoke/Flame.



Custom Transition in Smoke/Flame (Image courtesy of EVN PRODUCTIONS)



Custom transition in Lustre



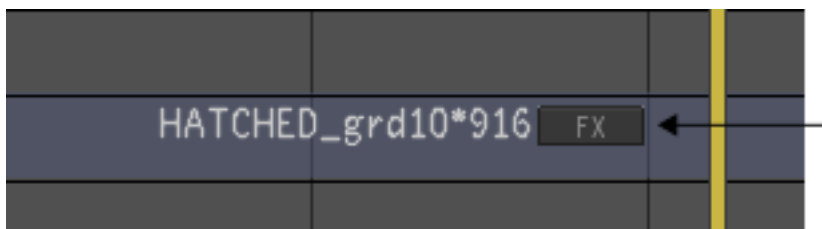
Custom transition in Smoke/Flame after render from Lustre

Timeline FX

Timeline FX are preserved in Lustre. Lustre retains the Timeline FX metadata and displays the source clip rather than the result clip of the Timeline FX. Timeline segments with Timeline FX are displayed in the Lustre sequence with a Timeline FX icon. The Timeline FX are reapplied in Smoke/Flame when you reload the sequence. The following Timeline FX are supported:

- TimeWarp
- Resize
- Text
- Colour Correct
- Spark
- GMask
- Action
- Stereo Toolbox
- Flip
- Colour Warper
- Blur
- 2D Transform
- Composition parameters
- Format options
- Pre-processing parameters
- Containers
- Matte Containers

Note: Format Options and Pre-Processing parameters are only available in Lustre on clips for which the media is not cached.

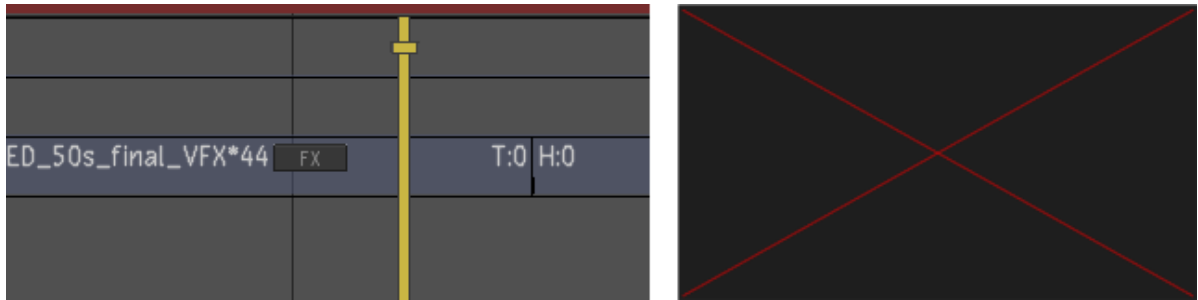


Adjustment layers are supported like any other Timeline FX. However, they are not displayed when scrubbing or playing back in Lustre and cannot be graded. The original adjustment layer is restored in Smoke/Flame when you reload the sequence after it has been rendered in Lustre.

- If there is media under the adjustment layer, that media is displayed in the viewport.

- If there is no media under the adjustment layer, a red "X" is displayed in the viewport.

NOTE In the case of a soft timewarp that is not long enough to cover the duration of the segment (for example, a slow-motion effect), Lustre preserves the duration of the segment but displays a red X on missing frames. This is normal because you are grading the sources, which are not being affected by the timewarp animation curve.



Containers and Matte Containers

Containers and matte containers created in Smoke/Flame are preserved in Lustre.

- By default, Flame renders only the timeline effects required for the sequence. Effects located inside Containers & Matte Containers that are not required are not rendered. Since exchanging content with Lustre might require rendering more content, it is now possible to render all timeline effects located inside containers and matte container. The Full Container Render option located in the Flame preferences menu in **PreferencesTimelineRendering** ensure that all effects are rendered. This option also works foreground rendering, Burn and Background Reactor. This preference is saved on a project basis.
- Before rendering, make sure to select the Container or Matte Containers. If the Containers are not explicitly selected, only the visible effects will be rendered. This behavior happens when selecting an empty top video track and clicking Render. In this case, the rendering is optimized to only render the required effects, even if the Full Container Render option is enabled.
- Matte Containers can be used in Lustre when a sequence is imported from Flame Premium. Matte Containers availability is not limited to the Source Grading import method, but prior to importing sequences with Matte Containers in Lustre, make sure to:
 - Render any timeline effects to avoid ending up with missing media in Lustre.
 - Disable any Comp effects applied on Matte Containers. If the Comp effect is not disabled, only the output of the Comp will be available to Lustre.

TIP

- To add a matte to the first frame of a source clip in a matte container/multi-channel clip in Lustre, press Ctrl and drag and drop the matte to the container.
- To insert the matte at the first frame of the In point of the timeline segment, press Ctrl+Alt and drag and drop the matte to the container.

See:

[About Containers](#) (page 288)

[About Matte Containers](#) (page 290)

[Adding a Matte to a Matte Container](#) (page 291)

[Selecting a Matte to Grade Secondary Layers](#) (page 291)

Multi-channel Clips

Multi-channel clips created in the Lustre sequence are recreated as matte containers in Smoke/Flame.

See:

[About Multi-channel Clips](#) (page 292)

Saving a Sequence for Grading in Lustre

To save a sequence for grading in Lustre (Source Grading Workflow):

- 1 Render your BatchFXConnectFX.
- 2 Save your sequence to the Lustre shared library.

To save a sequence for grading in Lustre (Sequence Grading Workflow):

- 1 Render your entire sequence.
- 2 Save your sequence to the Lustre shared library.

Importing the Sequence from Smoke/Flame

To import a sequence from Smoke/Flame:

- 1 Open the Editing/Browse menu in Lustre.
- 2 Determine whether you want to work using the Source Grading or the Sequence Grading workflow. If you are working in the Source Grading workflow, enable Source Grading. If you are working in the Sequence Grading workflow, disable Source Grading.



- 3 Navigate to the folder that contains the sequence you want to import.
- 4 Drag your sequence directly from the file browser to the storyboard area.
- 5 Your sequence and its sources are added to the library. You are now ready to grade.

NOTE

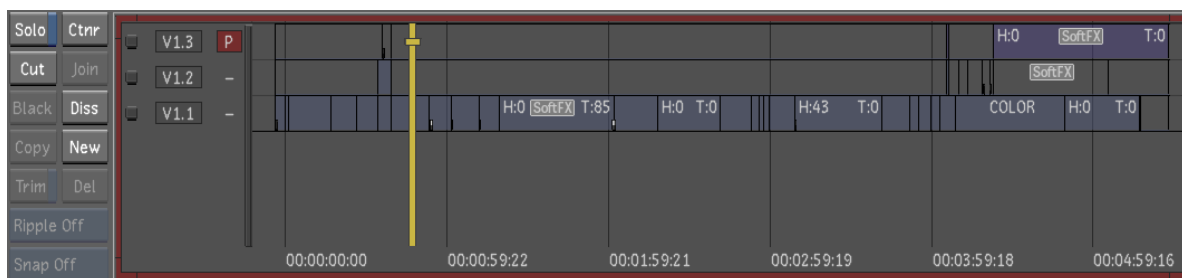
- If you import an unrendered sequence without enabling Source Grading, Lustre looks for the processed Timeline FX segments in the sequence rather than the source clips and displays black frames on unrendered effects. This also applies to relink media. If you relink media to an unrendered sequence without enabling Source Grading, Lustre looks for the processed Timeline FX segments in the sequence rather than the source clips and displays a red X on unrendered effects.
 - The behavior in Lustre has not changed when importing with Timelines Only disabled, even if Source Grading is enabled. The one sequence version of the sequence sources will be imported as before.
-

Displaying and Editing the Sequence in Lustre

It is not recommended to make editorial changes in Lustre to clips with Timeline FX or transitions. Editing clips with Timeline FX or transitions may cause unexpected results when you open the sequence in Smoke/Flame.

To display the Smoke/Flame sequence for editing in Lustre, it is recommended to use the Colour/Timeline menu. Some editorial functions are locked in this menu to prevent any accidental editorial changes.

All editorial changes you make in Lustre are supported in Smoke/Flame.



See:

[Timeline Menu](#) (page 277) for a complete list of supported editing operations in Lustre.

Rendering and Exporting in Lustre

Rendering Back to Smoke/Flame

There are two ways to render your sequence back to Smoke/Flame from Lustre:

- Rendering to the shared Lustre Library
- Rendering to a shared storage location

Rendering to the Lustre Shared Library

When rendering to a Wiretap location from Lustre, you are rendering to a Smoke/Flame standard file system. To render to a Smoke/Flame standard file system, you must set your Renders paths to refer to a Wiretap server path (A destination folder on the Smoke/Flame standard file system. The Lustre shared library is the recommended destination).

NOTE You can create Shared Libraries and folders in the Media Library of the Smoke/Flame projects directly from Lustre and use it as a rendering destination from Lustre.

For example:

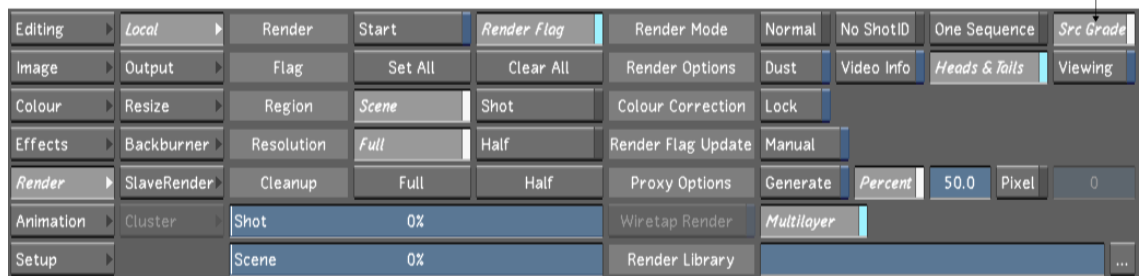
oshawa@wt:/stonefs7/Hatched_Project/Lustre

The resulting rendered media is located on your standard file system and is managed by Smoke/Flame.

NOTE By default, Flame Premium configures the Lustre project to render to a Smoke/Flame library.

To render to the Lustre shared folder:

- 1 Access the Project Settings, in the Setup/Settings menu.
- 2 Make sure your Renders Home paths are set correctly. For example: oshawa@wt:/stonefs7/Hatched_Project/Lustre.
- 3 Access the Render/Local menu in Lustre.
- 4 Enable the Src Grade render mode.



- 5 (Optional) Enable the Heads & Tails option.
- 6 Click Start.

Rendering to a Shared Storage Location

If you want Lustre to render back to shared storage, such as a SAN or a NAS, your Renders paths must refer to a storage path outside your standard file system.

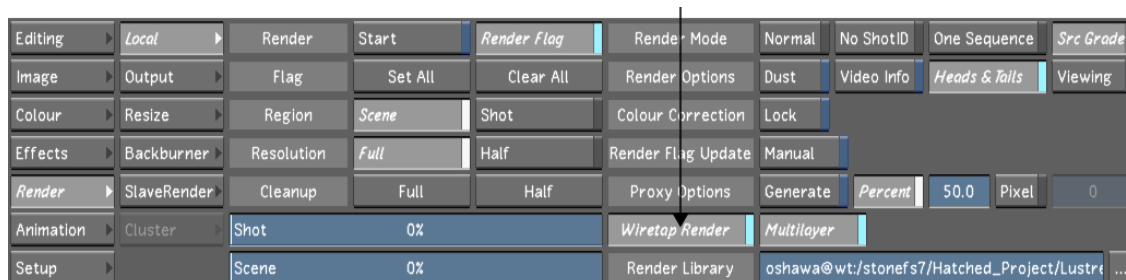
For example:

/mnt/SAN01/Hatched_Project

The resulting media is rendered to a location on your SAN/NAS while the metadata is sent to the Wiretap server. The resulting sequence is seen as soft-imported in Smoke/Flame . This media is not managed by Smoke/Flame.

To render to a shared storage location:

- 1 Access the Project Settings, in the Setup/Settings menu.
- 2 Make sure your Renders Home paths are set correctly. For example: /mnt/SAN01/Hatched_Project.
- 3 Access the Render/Local menu in Lustre.
- 4 Enable the Src Grade render mode.
- 5 (Optional) Enable the Heads & Tails option.
- 6 Define the Wiretap location to which you want Lustre to save the metadata in the Render Library field.
- 7 Enable the Wiretap Render option.



8 Click Start.

NOTE

- You can define the Wiretap location for the metadata permanently for your project in the Project Settings Network Rendering tab, in the Render Library field.
- Re-rendering the same sequence from Lustre replaces the media on the shared storage. If you make changes to your grades and re-render the sequence, all Smoke/Flame sequences using the same media are updated with the new rendered sources.
- If you are using workstations running different operating systems within your interoperability workflow (Smoke for Mac OSX, Lustre on Microsoft Windows, Linux) and want to render to a shared storage location, you must configure your Wiretap Path Translation file, as each operating system (Mac, Windows, Linux) has a different path to the same location.

See [Autodesk Flame Premium Install Guides](#)

Outputting the Final Version from Lustre

There are two ways to output your final version from Lustre:

- Rendering the final version from Lustre as one sequence in an uncompressed format to a location outside the Standard fs.
- Exporting the final version from Lustre to a compressed format to a location outside of the Standard fs.

Rendering the Final Version from Lustre

Depending on the state of your sequence at the point where you decide to perform your grading in Lustre, or the nature of your project, you may want to render the final version of your project from Lustre.

To do this, you must set your Lustre Renders paths to point to a location outside of the Smoke/Flame Standard fs.

- 1 Access the Project Settings, in the Setup/Settings menu.
- 2 Make sure your Renders Home paths are set correctly. For example: mnt/StorageMedia/Renders.
- 3 Access the Render/Local menu in Lustre.
- 4 Enable the One Sequence render mode.
- 5 (Optional) Access the Render/Output menu.
- 6 (Optional) Disable Same format as scans and select an output format.
- 7 In the Render/Local menu, Press Start.

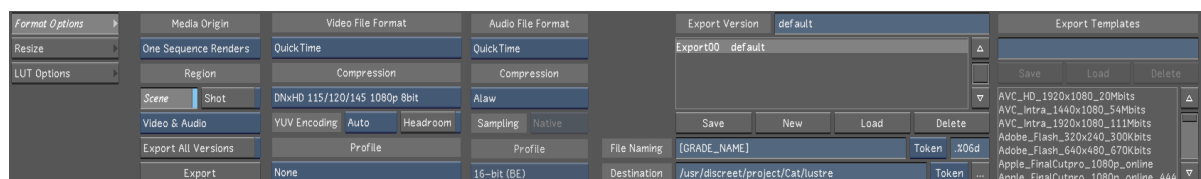
Lustre renders your timeline as one sequence at the specified destination.

Exporting the Final Version from Lustre

Depending on the state of your sequence at the point where you decide to perform your grading in Lustre, or the nature of your project, you may want to export the final version of your project from Lustre to a compressed format. This is done through the Render/Export menu.

NOTE Your sequence must be rendered prior to exporting.

- 1 Render your project in One Sequence mode.
- 2 In the Render/Export menu, create a new Export version. See Export Versions.
- 3 Set the Media Origin field to One Sequence Renders.
- 4 Set the Region field to Scene to export all shots.
- 5 If the sequence has audio media and that you want to be included in the export, enable the Video & Audio option.
- 6 Set the Video File Format and the Compression type for your audio and video or select a profile, if available.
- 7 Define the File Name using tokens or an actual alphanumeric filename.
- 8 Define the Export Destination.
- 9 Save your Export Version.
- 10 Click Export.



Proxy Rendering

- You can render proxies from Lustre to Flame Family projects, in the context of Interop.

Enabling the Proxy Rendering option, in the Project Management / Network Rendering menu, generates both High Resolution and Proxy Resolution footage at render, for all projects. If disabled, only high resolution footage is generated at render and proxy generation must be done manually in Flame, Flare or Flame Assist. The Proxy Rendering option is disabled by default.

Advanced Interoperability Workflows

RED Media Interoperability Workflow

When importing RED footage in Flame Premium, you can transcode the media prior to import. The transcode settings determine the resolution, bit depth, colour settings, etc. of the media created from your R3D files. If you choose to soft-import your media (i.e. linking to the media from its original location), you are able to access the media at any of the resolutions supported by its debayer in Lustre, after importing the timeline. This can be helpful for grading, where a high level of detail can sometimes be critical.

To illustrate this workflow, we are importing an FCP xml file and soft-importing its associated RED sources for conforming in Smoke. We then import the Flame Premium sequence in Lustre, where we can modify

the media's transcode settings to perform our grading tasks on the full resolution footage. Once done, we render the sequence back to Smoke for further enhancement.

We are assuming that you have already created your Flame Premium and Lustre projects and that the Lustre library has already been generated.

Importing RED footage to Flame Premium

- 1 Click the Conform tab.
- 2 From the contextual menu, select Load new FCP XML / AAF.
- 3 Navigate to the location of the RED footage (with xml) to soft-import.

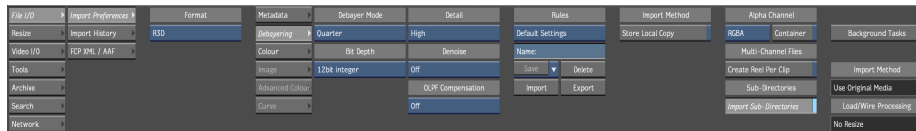
You can apply resize settings and apply a LUT on import from the Transcode menu. See

■ [Transcode Resize Options](#) (page 227)

■ [LUT Options Settings](#) (page 223)

NOTE If you are accessing media that was imported to a Smoke/Flame system with the Cache Source Media option enabled, that media is no longer considered Gateway media. It is seen by Lustre as managed media and hence the LUT and Resize on import options are not available. To work around this, you can perform a Flush Cache Media operation in Smoke / Flame, prior to importing in Lustre.

If you want to change the transcode settings of your media, you can do so from the File I/O menu under the Media Browser prior to importing. If you don't make any changes, the media is imported with the camera settings.



- 4 Select the FPC XML and click Import.

Smoke finds the sources and reassembles the sequence.

Your sequence is now available in Flame Premium for editing. Once you are satisfied with the sequence and are ready for grading in Lustre, save it to a library and exit Smoke.

See [Saving a Sequence for Grading in Lustre](#) (page 22).

Accessing the Flame Premium sequence for grading in Lustre

Because we are working with soft-imported RED footage, once the Flame Premium sequence is imported into Lustre, you can modify the transcode settings set in Flame Premium and access the footage at up to full resolution for grading.

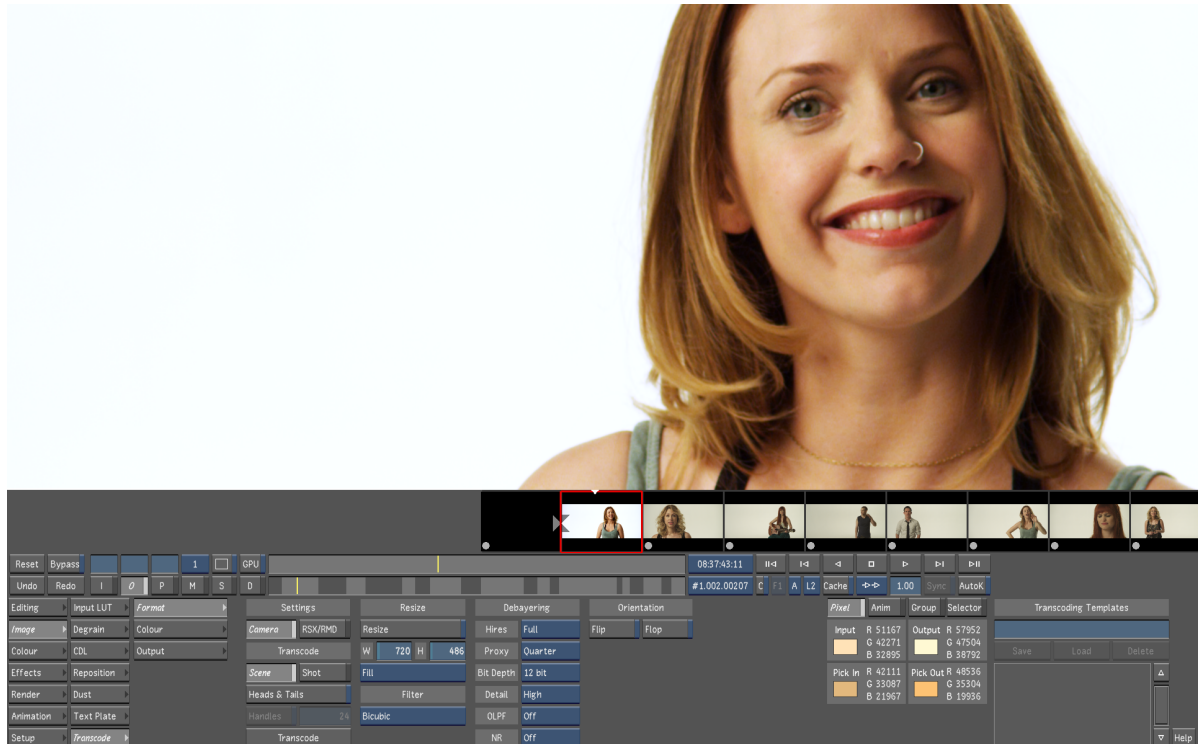
To access the Flame Premium sequence from Lustre

- 1 Access the Editing/Browse menu.
- 2 Navigate to your Flame Premium project.
- 3 Enable Source Grading.
- 4 Drag & drop the Flame Premium sequence onto the storyboard.

The sequence and its associated sources are automatically added to the Library.

Modifying the Flame Premium transcode settings

Access the Image/Transcode menu. You can modify any of the transcode settings that you like; one of which being the debayering settings. Changing the debayering settings will enable you to work at any of the resolutions supported by the debayer: a higher resolution for greater detail or a lower resolution for more responsiveness. The resolution of the media is immediately updated in the viewport and you are ready to grade your sources.



Footage taken from "Other People's Children", courtesy of Golden Films.

Once you are happy with your grades, you have a few options:

Option 1

Render the sequence back to Flame Premium for further enhancement. Lustre creates new (graded) sources and a new sequence (containing all the metadata from the original sequence). The format of the footage is no longer RED media. Instead the sources are in uncompressed RGB, on the Flame Premium Standard fs.

See [Rendering and Exporting in Lustre](#) (page 23).

Option 2

Render the final version from Lustre as one sequence in an uncompressed format to a location outside the Standard fs.

See [Rendering and Exporting in Lustre](#) (page 23).

For more details on rendering media in Lustre, see [About Rendering in Lustre](#) (page 591).

Option 3

Export the final version from Lustre to a compressed format to a location outside of the Standard fs.

NOTE The sequence must be rendered prior to exporting.

See [Rendering and Exporting in Lustre](#) (page 23).

For more details on exporting media from Lustre, see [Background Media Export](#) (page 623).

ProRes Interoperability Workflow

It is possible to import and export ProRes footage to and from Autodesk Smoke, Flame and Lustre applications. To accomplish this, you must have access to a Mac computer running Autodesk Backburner (which is automatically installed if you are running Smoke on the Mac computer).

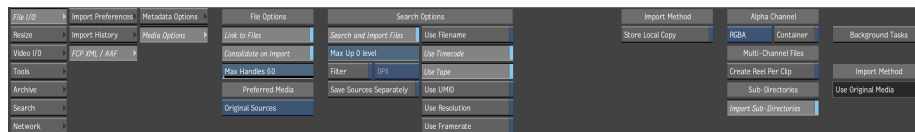
For information on installing Backburner, see the [Autodesk Flame Premium Install Guides](#).

This workflow demonstrates how to import ProRes footage from a Final Cut Pro .xml into Smoke and send the conformed sequence to Lustre for grading in Source Grading mode. We then export the graded ProRes sources from Lustre to relink them with the original Smoke sequence, preserving all metadata and soft effects.

Importing the ProRes footage and sequence into Smoke/Flame

To import a ProRes sequence into Smoke/Flame

- 1 Click the Conform tab.
- 2 From the contextual menu, select Load new FCP XML / AAF.
- 3 Navigate to the Mac computer with the ProRes media (with xml) on your local network.
- 4 Select the FPC XML.
- 5 Enable Consolidate on Import (recommended).
- 6 Set your Max Handles (recommended).



- 7 Click Import.

The sequence is now open in your Flame Premium workspace.

Once you are ready to grade the source files, save your sequence to the Lustre shared library.

Then, launch Lustre, navigate to the project where you saved your sequence, enable Source Grading and drag and drop the sequence to the storyboard. Your sources and the sequence are automatically imported to your Library. You are ready to grade your sources.

Once you are satisfied with your grades, you have a few options:

Option 1

Render the sequence back to Smoke/Flame for further enhancement. Lustre creates new (graded) sources and a new sequence (containing all the metadata from the original sequence). The format of the footage is no longer ProRes media. Instead the sources are in uncompressed RGB, on the Smoke/Flame Standard fs.

See [Rendering and Exporting in Lustre](#) (page 23).

Option 2

Render the final version from Lustre as one sequence in an uncompressed format to a location outside the Standard fs.

See [Rendering and Exporting in Lustre](#) (page 23).

For more details on rendering media in Lustre, see [About Rendering in Lustre](#) (page 591).

Option 3

Export the final version from Lustre to a compressed format to a location outside of the Standard fs.

NOTE The sequence must be rendered prior to exporting.

See [Rendering and Exporting in Lustre](#) (page 23).

For more details on exporting media from Lustre, see [Background Media Export](#) (page 623).

Option 4 (Linux Only)

Export the graded sources from Lustre to the ProRes format and relink the graded sources back to the original Smoke/Flame sequence, for further enhancement.

NOTE The sequence must be rendered prior to exporting.

Exporting the Graded Sources from Lustre to the ProRes Format (Linux Only)

After having rendered the sequence in Lustre, you can set up a Source Grade export.

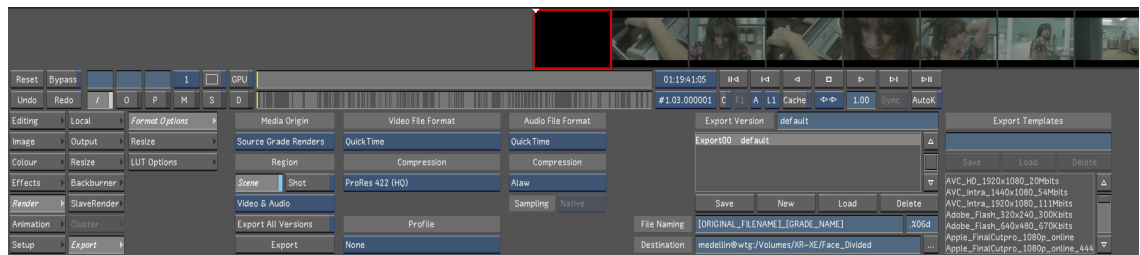
- 1 Access the Render / Export menu.
- 2 Set your export destination. This must be a Mac computer running Backburner. The Backburner manager.host file must be edited to have the Flame Premium or Lustre Linux system as the Backburner manager.

To edit the manager.host file

- 1 From a shell, login as root.
- 2 Navigate to /opt/Autodesk/backburner/cfg/manager.host.
- 3 Open the file for editing with a text editor.
- 4 By default, the backburner manager is set to localhost. Change this to the name or IP address of your Flame Premium or Lustre Linux workstation.
- 5 Save the file and exit.

NOTE If the backburner manager is set to localhost in the manager.host file on your mac, this workflow will not work. You will get error messages when trying to export.

- 3 In the Render / Export menu, select Source Grade Renders, under Media Origin.
- 4 Select Video & Audio, under the Region buttons.
- 5 Select QuickTime under Video File Format.
- 6 Select one of the ProRes codecs under Compression.
- 7 Press Export.



Footage taken from "Face Divided", courtesy of Red Truck Productions.

Lustre begins exporting the media.

NOTE If the sequence is not rendered, Lustre automatically starts a render before exporting.

Updating the Sequence with the Graded Sources

Once the media is exported:

- 1 Launch Smoke/Flame.
- 2 Click the MediaHub tab.
- 3 Navigate to the folder containing exported ProRes sources.
- 4 Drag the folder to the Media Library in the Media panel.
- 5 Still in the MediaHub, navigate to the folder containing your original sequence and drag it to the Media Library in the Media panel.
- 6 Click the Timeline tab.
- 7 Select the original sequence you just copied to the Media Library in the Media panel.
This displays the sequence with all of its sources unlinked.
- 8 Click the Conform tab.
The list of unlinked media is displayed on top of the sequence.
- 9 Select the folder containing your exported ProRes sources.
- 10 From the contextual menu, select **Conform ► Set As Search Location**.
Your sources are found. A green check mark appears next to the matched sources.
- 11 Click Link Matched Sources.
Your original sequence is assembled with the new graded ProRes sources, with all its original metadata intact.

You can now continue refining your graded sequence. This workflow can be repeated as many times as you wish. When you are happy with your sequence, you can render or export it to the format of your choice.

Connected Colour Workflow

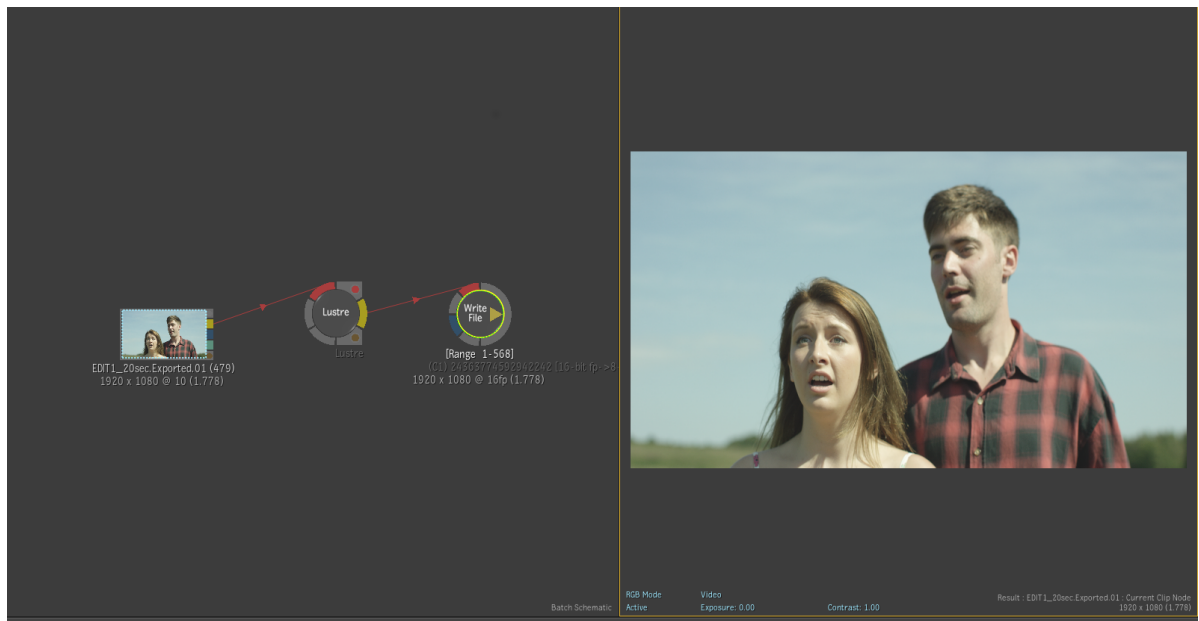
5

In today's feature film colour grading market, the grading suite has been gaining in importance. This is because it is often the place where the director and his creative team get to see their film come together, with the final effects and colour correction. During this process, it is quite common for them to notice small things they'd like to improve that are outside the scope of traditional colour correction. Even if the fixes may only take a few minutes of work, today, the only option is to defer these changes to a VFX session.

The Connected Colour Workflow enables basic effects work during client-attended grading sessions, by harnessing the power of the Flame Family's Batch procedural compositing environment (Flame or Flare, running concurrently on the same workstation).

Basic Workflow

You're grading a shot in Lustre and would now like to add, say a Glow effect to the shot. You can promote the shot (including matte containers and external mattes) along with all of the grading data from the Lustre pipeline to Batch. The Lustre pipeline is represented as a Batch node. From there you can insert effects nodes (in our example, a Glow) before, after or in between the different stages of the Lustre pipeline (after exploding the Lustre node). Once you are happy with the effect, you render the shot in Batch and it immediately becomes available in Lustre, with the added effect(s) and the grade intact. Note that any grading done on top of the effect remains live in Lustre.



Requirements

- In order to use the Connected Colour Workflow, either Flame or Flare must be installed on the same workstation as the Lustre application. Make sure to start Flame or Flare prior to launching Lustre.
- In a Flame Premium configuration, both Lustre and Flame use the same project location to store data and it is possible to use Flame to archive.
- In a Lustre/Flare or a Lustre/Flame (standalone) configuration, there is no shared project between the two applications. To use the Connected Colour Workflow in a Lustre/Flare or a Lustre/Flame (standalone) configuration, do the following:

- 1 Install Lustre and Flare/Flame (standalone).
- 2 Start Flare/Flame (standalone) and create a project.

This project should be defined with settings that are compatible with the project you will create for Lustre (resolution, bit depth, frame rate, SDI Preview, etc).

NOTE It is possible to create a Lustre project from the Project Management page BUT Lustre will not see these projects unless the Lustre init.config file is modified to read projects located in /opt/Autodesk/project. See:

http://help.autodesk.com/view/FLAME_P/2016/ENU/?guid=GUID-4DEAF98C-F6FC-43B8-89A5-CD877A1F9DD1 for more information.

- 3 Start Lustre and create a project

There is no need to modify Lustre's project home location. The Lustre data will be saved in Lustre project's folder structure and Flare/Flame (standalone) will write Batch metadata to this location

Interoperability Between Lustre and Flame

Source clips referencing media files that have been Hard Committed in Flame are now displayed in Lustre as referencing the original media files. This can reduce the playback performance issue in Workgroup configurations that use shared storage. In previous releases, Hard Committed media would not use the direct storage but rather use the network storage.

When creating a Flame Premium project, the following settings are stored on the current storage partition as defined in the Flame project:

- Full & Half Scans locations
- Transcode (Hires & Proxy locations)
- Export Destination
- Degrain Cache
- Batch Renders

NOTE In order to allow for easier cleanup of unmanaged media, Degrain Cache and Batch Renders are stored in a folder based on the name of the current project.

Resource Management

Memory Management Tokens

Two tokens located in the `init.cfg` file enable you to define the percentage of Memory and Graphics Memory to reserve for the application. These tokens deprecate both the `MemoryApplication` token and the `-M` startup switch. They are:

- `MemoryConsumptionTarget`
- `GraphicsMemoryConsumptionTarget`

See the `init.cfg` file for additional details, but in most cases, you do not need to worry about these. If you are using Connected Colour workflow, see Memory Settings for Connected Colour Workflow below.

NOTE The recommended ratio for system-memory (RAM) to graphics card memory (VRAM) is 3-1. If you are using Shot Reactor, add up the values of both graphics cards before calculating the right ratio.

Memory Settings for Connected Colour Workflow

When running simultaneously Lustre and Flame/Flare on the same system, each application tries to acquire most of the resources of the workstation. To make sure the applications behave, configure Flame's *GraphicsMemoryConsumptionTarget* and *MemoryConsumptionTarget* percentages to one of the following recommended values. The percentages depend on both the complexity of the work, and the amount of available memory resources.

NOTE When reading the tables below, the presence of a second graphics card for Shot Reactor has no impact: only consider the VRAM of one card.

Working Resolution: 4K / UHD

Grade Complexity	VRAM Present on the Graphics Card			Installed RAM			
	6 GB	12 GB	24 GB	16 GB	32 GB	64 GB	128 GB
Low	50%	70%	80%	50%	70%	80%	85%
Medium	N/R	60%	75%	N/R	65%	75%	80%
High	N/R	50%	65%	N/R	60%	75%	80%

	GraphicsMemoryConsumptionTarget percent- age	MemoryConsumptionTarget percentage
--	---	------------------------------------

Working Resolution: 2K / UHD

	VRAM Present on the Graphics Card			Installed RAM			
Grade Com- plexity	6 GB	12 GB	24 GB	16 GB	32 GB	64 GB	128 GB
Low	80%	85%	85%	80%	85%	85%	85%
Medium	75%	80%	85%	75%	80%	85%	85%
High	65%	75%	85%	75%	80%	85%	85%
	GraphicsMemoryConsumptionTarget percent- age			MemoryConsumptionTarget percentage			

Where:

- Low complexity grade: 1 external matte, 12 secondaries, de grain and HLS/Diamond keyers.
- Medium complexity grade: 2 external mattes, 24 secondaries, de grain and HLS/Diamond keyers.
- High complexity grade: 4 external mattes, 48 secondaries, de grain and HLS/Diamond keyers.
- N/R means not recommended configuration since the available memory is too low.

Detailed Workflow

This procedure assumes you have a graded shot open in Lustre and have already launched Flame or Flare.

- 1 Assign the same viewing transform in both Lustre (Setup / Calibrate) and Flare (Preferences / LUT).
- 2 In Lustre, go to the “Effects” tab.
- 3 Click the “Plugin” button once, to toggle its function from “Plugins” to “Batch”. The “Create” button appears.
- 4 Click the “Create” button.

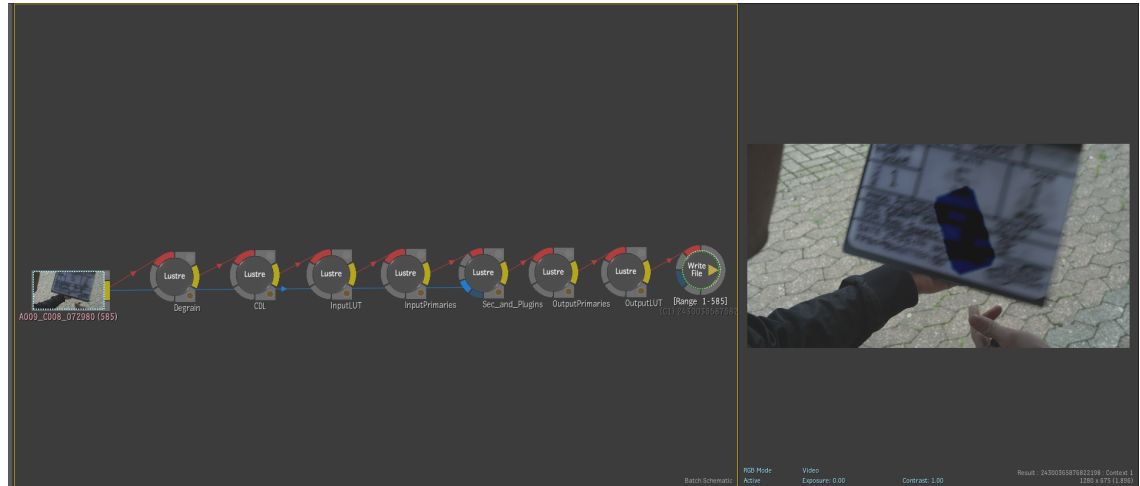
The interface automatically switches to the Flame Family application and a simple Batch Setup is displayed in Flare, in 2-up view. It consists of the source clip, a Lustre node and a Write File node on the left (schematic view) and a Context view of the Write File node on the right. The positioner is located at the same time location as it was in Lustre. The Context view shows the output of the entire pipeline, including the grade and should match what you saw in Lustre. (As usual in Flare, to see the output of a given node, select the node and hit F4).

- 5 Insert Batch nodes before or after the Lustre node to add additional effects to your shot, while preserving the grade.
- 6 If you want to insert your effect somewhere inside the Lustre pipeline, you may Explode the Lustre node, by selecting it and choosing “Explode Lustre”, from the contextual menu.

This displays each stage of the Lustre pipeline as a Batch node, enabling you to add additional Batch nodes from Flare inside the Lustre pipeline. For example, a colorist may want to use the Input Primaries

in Lustre, to balance the shot out and then insert and effect, say a Glow, and after that go through the Lustre Secondaries and Output.

NOTE In order to fully explode the Lustre node, you must (back in Lustre) go into Colour / Secondaries and enable Src: Prim before you create your BatchFX. Otherwise the parts of the Lustre pipeline before the Output Primaries will remain collapsed into the first node. (If you want to change the order of the Input LUT and CDL, you also need to do that before creating the effect.)



The fully exploded Lustre nodes are as follows:

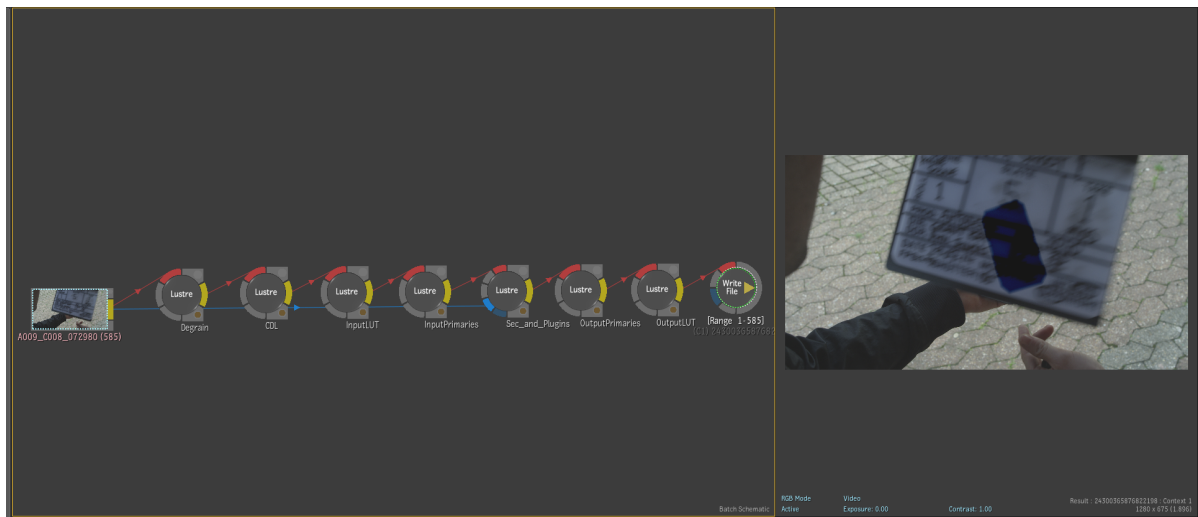
- Degrain
- CDL
- Input LUT
- Input Primaries
- Secondaries and Plugins
- Output Primaries
- Output LUT

Exploding the Lustre Node

If you want to insert your effect somewhere inside the Lustre pipeline, you can Explode the Lustre node, by selecting it and choosing “Explode Lustre”, from the contextual menu.

This displays each stage of the Lustre pipeline as a Batch node, enabling you to add additional Batch nodes from Flare inside the Lustre pipeline. For example, a colorist may want to use the Input Primaries in Lustre, to balance the shot out and then insert and effect, say a Glow, and after that go through the Lustre Secondaries and Output.

NOTE In order to fully explode the Lustre node, you must (back in Lustre) go into Colour / Secondaries and enable Src: Prim before you create your BatchFX. Otherwise the parts of the Lustre pipeline before the Output Primaries will remain collapsed into the first node. (If you want to change the order of the Input LUT and CDL, you also need to do that before creating the effect.)



The fully exploded Lustre nodes are as follows:

- Degrain
- CDL
- Input LUT
- Input Primaries
- Secondaries and Plugins
- Output Primaries
- Output LUT

Selecting any of the Lustre node in the schematic view displays detailed information from the Lustre cut and grade, such as:

- **Processing Stage:** The part of the Lustre pipeline performed by this node.
- **Shot Information:** Shot Name, Shot ID, Reel Name.
- **Grade Information:** Grade, Scene, Project.
- **Edit Information:** Cut, Shot TC, Shot Offset.
- **General:** Workstation, User, Modified Date.

Processing Stage	Shot Information		Grade Information		Edit Information		General	
Input LUT	Shot Name	A009_C008_072980	Grade	default	Cut	Banana	Workstation	lima
	Shot UID	24300365876822198	Scene	default	Shot TC	10:20:55:08	User	FLAME_2017_NOV24
	Reel Name	A009_C008_072980	Project	FLAME_2017_Nov24	Shot Offset	218	Modified	2015/12/01(14:44:04)

Rendering the Batch Effects

- 1 Once you've added your effects in Batch, click the "Render" drop-down menu and select a Render mode. Options are:
 - **Scene All:** This option performs a force render on all shots containing Batch Effects. This is useful when a modification is made in Lustre that would invalidate the Batch Effect (for example: modification of transcoding settings).

- The “Effects” tab in Lustre displays the “Batch Setup” filepath and the “Batch Renders” filepath (which may be adjusted in the Project Settings), as well as the current status of the different stages of the Lustre pipeline (all of the Lustre nodes in Flare).

Editing	Flare FX								
Image	Edit	Batch Setup	/usr/discreet/project/FLAME_2017_Nov24/lustre/default/Library/BFX/24300365876822198_default/Batc						
Colour	Enable	Batch Renders	/usr/discreet/project/FLAME_2017_Nov24/lustre/24300365876822198_default/1280x675/243003658768						
Effects	Render		Degrain	Baked	Input LUT	Soft	CDL	Baked	
Render	Burn		Input	Soft	Secondaries	Soft	Plugins	Soft	
Animation	Shot		Output Prim	Soft	Output LUT	Soft			
Setup	Delete FX								

The steps marked as Baked are included in the Flare render whereas the steps marked Soft are applied live in Lustre on this new "source."

You can continue grading, on top of the rendered effects, using any of the stages of the Lustre pipeline that remain 'Soft'. At any point, should you want to add more effects to your shot, click the "Edit" button under the Batch toggle to send the latest Lustre grade to Flare and automatically update the Batch Setup, while preserving the effect that was already built. BatchFX behave a lot like other aspects of a Lustre grade and may be copied from one shot to another and saved in the Grade Bin.

Setting Up a Dual DVI Configuration

It is possible to run both Lustre and Flame/Flare at the same time on a dual DVI configuration. In this environment, it is ideal to run each application in its own display so you can treat Lustre and Flare/Flare as a single application. To configure this setup, do as follows:

- 1 Connect two DVI displays to your workstation.
- 2 Install the DKU (if needed).
- 3 Install Flame Premium or Lustre and Flame/Flare. The installation process will detect the two monitors and configure the `xorg.conf` file. If the `xorg.conf` has been updated, you may need to reset the X Server to apply the changes.
- 4 Login to your workstation as a Flame/Flare User.
- 5 Run the Flame/Flare Setup application.
- 6 In the General tab, define whether you want Flame to run on a single or dual monitor:
 - In single mode, one monitor will show Lustre and the other will show Flame.

- In dual mode (i.e. when Single Monitor option is disabled), Flame will use both monitors and you will need to press Alt-Tab to go back to Lustre. In this mode, Flame uses both displays until Lustre is under mouse focus.
- 7 In the Xorg tab, enable Twin View.
- 8 Still in the Xorg tab, define the primary monitor as being on the right.
Flame can be set to run on the Left or Right monitor but Lustre can only use the Left monitor so you must define Flame Setup to use the Right monitor.
- 9 Reset the X Server.
- 10 Login to your workstation as a Flame/Flare User.

NOTE

- In a dual DVI configuration, the tablet margins are based on the aggregated resolution of the two displays. This means that the left part of the tablet will be used in Lustre and the right part by Flame.
- In this configuration, if you move the cursor to the top of the Lustre screen, you may see the KDE task bar momentarily displayed. The task bar disappears when the cursor is moved back down. If this behavior annoys you, you can move or remove through the KDE "Panel Settings" menu, accessed by right-clicking the task bar.
- Also, in order to ease navigation, you may want to disable the Swipe Bars in Flame/Flare. To achieve this, from the User Interface tab of the Flame/Flare Preferences, under Gestural Workflow, disable the Swipe Bars button.

SDI Preview in a Dual Application Workflow

When running Lustre and Flame/Flare on the same workstation, both applications will try to connect to the AJA board. The steps listed below enable you to manage communication to the AJA board.

NOTE The following only applies to the AJA 3G, 3G Quad and 4G. This feature is not supported in configurations that use the AJA OEM-2K, due to an AJA driver limitation. In this case, you must set either Lustre or Flame/Flare to use the AJA board and deselect SDI Preview in the other application.

For a Single DVI Configuration

- 1 Set the DVI monitor to display Flare/Flame's Batch tab.
- 2 Load a Batch scene from Lustre.
 - The Batch interface is set in 2-up view and the Scene context is set for monitoring.
 - The AJA SDI Preview is now set to Flame/Flare.
 - If you Alt+Tab back to Lustre, the AJA SDI Preview is automatically set to display Lustre.

For a Dual DVI Configuration

- 1 Set the DVI focus to the second DVI monitor.
- 2 Load a Batch scene from Lustre.
 - The Batch interface is set in 2-up view and the Scene context is set for monitoring.
 - The AJA SDI Preview is now set to Flame/Flare.
 - If you mouse over the Primary monitor, where Lustre is displayed, the AJA SDI Preview is automatically set to display Lustre.
 - The mouse over now dictates which application uses the AJA SDI Preview.

Disabling Automatic SDI Switching

There are cases in which you may not want to automatically switch the AJA SDI preview to the focused application. For example, a Lustre colorist may want to modify a Batch effect without the people present in the finishing suite seeing the modification being made, but only the result. This is achieved as follows:

In Flame / Flare

- 1 From the Broadcast Monitor Preferences menu, disable the Auto SDI Acquire option. You can also select the No Preview option from the SDI Timing drop down to release the SDI Preview.
- 2 From the Audio Preferences menu, disable Enable Audio.
- 3 From the Viewing Options menu in Batch, use the SDI Preview button to enable / disable SDI Preview. The Monitor button located in the Batch Viewport can also be used to enable / disable SDI Preview

In Lustre

- 1 From the Editing / Playout menu, disable the Auto SDI Acquire button.

Connected Colour Workflow Considerations

While the Connected Colour Workflow integrates Lustre and Batch very efficiently, the following considerations must be taken into account:

Grade Invalidation

- When you apply Batch Effect post Lustre node, the resulting shot in Lustre is seen as being part of the baked grade. Any modification to the grade requires a render of the Batch scene. A warning is shown when applying any modifications that would invalidate the Batch Effect.

Burn

- Burn can be used to render Batch effects from Lustre but requires Flame/Flare to be running.

LUTs & Colour Transforms

- Viewing LUTs and Colour Transforms are not shared between the applications, so make sure to manually set viewing in both applications in order to view the expected results.
- The Colour Management View transform mode set on a clip in Flame is preserved in Lustre, however it cannot be edited.
- A timeline, imported via the wiretap server, that contains a clip with a view transform mode, has its UI disabled in Lustre to protect it from editing. The transform is applied in the player, but you cannot edit it. The only way to modify it is by copying another colour management mode using the selector, or by loading a transcode template.
- The library and the browser display information this information accurately. This means that if we transcode or render a clip that has a view transform, the destination clip is tagged with this colour space.

Batch Renders

- The default Project location for Batch renders is the project home folder. Make sure to change this location to a location on your fast storage. This also applies to the Degrain cache location.

Retime from Lustre

- Content that has been retimed in Lustre is not seen in Batch as retimed content. Any effect work is done pre Retime effect.
- Avoid applying a Batch effect to a shot that has a reverse Retime effect, as the result may not be accurate.
- Content with a Retime effect applied in Lustre will not have the correct speed in Batch. This limitation means that you can still apply Batch nodes before the Lustre node but the preview of the effect is not correctly displayed in Batch. Applying Batch nodes after the Lustre node creates inadequate results since the retime effect is not computed.

Gang & Group

- Modifications done through Gang and Group to Batch effects are not yet supported.

Flip/Flop, Reposition, Resize & Crop

- The Flip/Flop effect applied in Lustre is displayed as part of the Read File node in Batch.
- Any modifications applied to the Flip/Flop effect in Lustre, after a Batch effect has been applied, might require modifications to the Batch Effect in order to adapt the effect to the updated media orientation. For example, a Paint effect in Batch on flipped media would require modifications to the paint effect for it to appear in the correct position on the image. This is because the Flip/Flop effect is never rendered by Batch, but simply displayed by the Read-File node. The Flip/Flop effect is rendered by Lustre.
- Reposition and resizing are part of the Write File node in Batch, so any modifications done in Batch is applied to the original media. This provides Lustre with the ability to modify the Reposition and Resizing parameters, post Batch Effects, without having to re-render the Batch Effects.
- When a shot is cropped or resized in Lustre, the Batch effect is applied to the original resolution of the media. While this behavior may not be expected in some cases, it enables a non destructive workflow allowing to reframe the content after adding Batch effects.
- Avoid using Top and Bottom Cropping with different Top and Bottom values when using shapes. If the Batch effects are applied next to the Lustre node, the position of the shapes may not be accurate.

External Mattes

- Though matte clips from Lustre are visible in Batch, they cannot be modified or connected to a node that would modify the clip. It is also not possible to connect a matte to the Write File node. The recommended practice for external matte is to first import them in Lustre, since they cannot be added in Batch. Working with mattes in Batch is still possible, however the actual matte clips will not be displayed in Lustre.
- When working with external mattes from Lustre, avoid changing media attributes (Flip/Flop, resize, etc) in Batch as Matte media is not affected and the result will not be accurate.

Mac OSX

- Importing a Batch setup that contains a Lustre node on a Mac-based Flame Family product will not render the Lustre grade. Lustre grade rendering is only available on Flame Family Linux-based products. On OSX, the Lustre node is a pass-through node, where the effect is not applied but the Batch scene can still be rendered.

Batch Bins

- Within Batch, it is possible to save in any Batch bin to a Lustre node. This way, the grading effect can be applied to other Batch scenes. If the Lustre node requires a matte, recalling a Lustre node will not

work since the grade requires a matte input to produce a valid result and the Lustre node does not have a matte input. An error message is displayed when loading the Lustre node to the Batch scene.

Handles

- You can decide if handles are provided to Flame when adding a Batch effect by enabling the Heads & Tails option in the Render / Local / Render Options menu. When disabled, only the media required for the shot is provided to Batch. When the option is enabled, the entire clip (including heads & tails) is provided to Batch. But in either case, the full duration of the source clip remains available in Batch. If Heads & Tails were disabled in Lustre, clicking the Write File node displays the duration of the shot between brackets and only those frames are rendered.

Flags

- Batch Flags are now available to mark the presence of a Batch effect on shots in Lustre:
 - **Yellow:** Indicates that the Batch effect on the shot is not rendered, meaning that what is displayed is not final.
 - **Green:** Indicates a rendered Batch effect on a shot.

Lustre Reactor

- Degrain cache cannot be generated in GPU mode. Disable GPU mode and then playback the shot that requires Degrain cache.
- Media generated with Batch effects is 16-bit float, even for integer cut in Lustre. This provides the highest rendering quality. In this workflow, avoid disabling GPU mode as the media may not be displayed correctly.

Using the Lustre Node in a Non-Connected Colour Workflow

- The Lustre node in Batch can be saved just like any other node in the Batch bins. This means that Lustre grading effects can be used in any Batch scene outside of a Connected Colour Workflow (i.e. on the same workstation or any workstation that is not running Lustre). This is a great workflow when you need to deliver graded content. However, there are some limitations:
 - If the Lustre node requires an external matte, it will not be possible to re-use this node in a Batch scene because of the dependency on the original Lustre content.
 - If the Lustre node requires external content such as a plugin applied in Lustre or a LUT or Color Transform, these must be available on the workstation using the grade. This is the case when, for example, the Batch setup is loaded on a different workstation than the one used by Lustre / Flame or Flare.

Project Management

6

Project Management is definition of project and user settings to customize the colour grading environment.

In Lustre, a project uses the following hierarchy:

- **Project:** Generally speaking, a Lustre project corresponds to a large work effort such as a film. A project contains all the information regarding the location of:
 - Project data files
 - Original footage
 - Rendered files
- **Scene:** A scene contains the Libraries, the Scene-based Grade Bin and degraigned material within the project.
- **Library:** The library contains the source clips, cuts, grades, audio and related metadata.
- **Cut:** A group of shots that get rendered.
- **Grade:** The operations performed on a cut.

In addition, a project also contains information about the users accessing the project, and their preferences. Lustre saves the preferences of each user of a project at the end of every work session. The saved settings are restored when the user logs back on.

To prepare a project for colour grading:

- 1 (Optional) Before running Lustre for the first time, configure the *init.config* file. See [Configuring System Settings](#) (page 45).
- 2 Create and set up the project. See [Project Configuration](#) (page 55).
- 3 Create and set up the users for the project. See [User Configuration](#) (page 81).
- 4 Create scenes. See [Working With Scenes](#) (page 98).
- 5 Organize the footage in cuts. See [Managing Cuts](#) (page 101).
- 6 Create grades. See [Creating a Grade Version for a Cut](#) (page 105)

Configuring System Settings

init.config When Lustre is installed, it is pre-configured with the default system-level settings in `C:\Program Files\Autodesk\<Lustre_version>\init.config` or `/usr/autodesk/<Lustre_version>/init.config`. The following can be configured:

- Wiretap and Wiretap Gateway server

- Calibration settings
- Autodesk Control Panel
- Lustre ShotReactor
- Backburner
- Internal keywords
- DPX keycode emulation list

See [Lustre Software, Project, and User Configuration Files](#) (page 46)

Lustre Software, Project, and User Configuration Files

Configuration File Overview

The configuration files define all the necessary settings your software needs to recognize various hardware and software settings on the Master Station and on the dedicated render station.

The following is a list of the Lustre configuration files.

NOTE Project and User creation in a standalone Lustre 2018 installation is the streamlined with the Flame Premium configuration. The Projects and Users are created and stored in the same file location as Flame Premium. This change implies that if you are using a pre 2018 standalone Lustre installation, you must modify the `init.cfg` file of the 2018 Standalone Lustre so that the 'MainProjectHome' and 'MainUserHome' file paths point to the same location as the previous configuration, in order to be able to work with those Projects and Users.

Configuration file	Pre 2018 Lustre Standalone Location	Flame Premium Grading Location	Description
<i>init.config</i>	<i>/usr/autodesk/lustre <version>/</i>	<i>/usr/autodesk/lustre <version>/</i>	This file stores system settings as well as Wiretap servers, Lustre ShotReactor settings, and film stock information.
<i>login.config</i>	<i>/usr/autodesk/lustre <version>/</i>	<i>/usr/autodesk/lustre <version>/</i>	This file records the last user and last project used so at the next session, the user and project login defaults will reflect these values.
<i>project.config</i>	<i>/usr/autodesk/projects/<project>/project.config</i>	<i>/opt/Autodesk/project/<project>/project.config</i>	This file stores project-level information including project settings, calibration, rendering, engineering, and Backburner and Wiretap settings specific to the project.
<i>user.config</i>	<i>/usr/autodesk/users/<user>/user.config</i>	<i>/opt/Autodesk/user/grading/<user>/user.config</i>	This file stores user settings specific to a particular user, such as Autosave, printer light, GUI background/gain/gamma.

Configuration file	Pre 2018 Lustre Standalone Location	Flame Premium Grading Location	Description
<user>Context.config	/usr/autodesk/projects/<project>/<user>Context.config	/opt/Autodesk/project/<project>/<user>Context.config	This file stores several settings relevant to the context of a particular user working on a particular project. The purpose of storing context-specific information is that there are some parameter settings that, by their nature, are more likely to be needed in the next session, but that are not configurable in the Project Management pages.

System Settings

You can configure the system settings manually in the *init.config* file. If these system settings are not configured, Lustre uses the default system settings. The following table describes the relevant system settings that can be configured.

NOTE All keyword values are case-sensitive.

Parameter	Data type	Default	Function
<Locations>			
<MainProjectHome>	String		Location of the Project configuration settings folder.
<MainUserHome>	String		Location of the User configuration settings folder.
<GlobalGradeBinHome>	String		Defines the location of the global Grade bin.
<LutHome>	String	[LUSTRE_HOME]/lut	Defines the location of the LUTs. NOTE If you are configuring a remote ShotReactor system, and [LUSTRE_HOME] is located on a mounted network drive, make sure you use the full UNC path of the network folder instead of the mapped drive letter.

Parameter	Data type	Default	Function
<PresetsHome>	String	[LUSTRE_HOME]/presets	Defines the location of the presets. NOTE If you are configuring a remote ShotReactor system, and [LUSTRE_HOME] is located on a mounted network drive, make sure you use the full UNC path of the network folder instead of the mapped drive letter.
<PluginsHome>	String	[LUSTRE_HOME]/plugins	Defines the location of the plug-ins. NOTE If you are configuring a remote ShotReactor system, and [LUSTRE_HOME] is located on a mounted network drive, make sure you use the full UNC path of the network folder instead of the mapped drive letter.
<TemplatesHome>	String	[LUSTRE_HOME]/templates	Defines the location of the templates. NOTE If you are configuring a remote ShotReactor system, and [LUSTRE_HOME] is located on a mounted network drive, make sure you use the full UNC path of the network folder instead of the mapped drive letter.
<Help>			
<HelpWebBased state>	String	On	Defines the location of the Lustre Help that is opened by the Help button and shortcut. Lustre Help is web-based by default.
<HelpLocalPath>	String		Defines the default location for Lustre Help when it is installed locally.
<Browser>			
<HideFolder> (within <MediaBrowseHideFoldersGroup>)	String	degrain_cache,original,matte,marry_grade, and 128x96	Hides the degrain cache, original, matte, marry_grade, and 128x96 folders from the file browser. NOTE You can hide any additional folder by adding the folder name to the list.
<Wiretap>			
<ServerAuto>	State	On	Specifies whether Lustre automatically scans for Wiretap servers.

Parameter	Data type	Default	Function
<WiretapServer> (within <WiretapServer Group>)	String	0.0.0.0	The IP address or DNS host name for a specific Wiretap server. If one or more <WiretapServer> keywords are set to valid Wiretap server addresses, Lustre lists the content of these servers in the browser before the results of the auto scan. If <ServerAuto> is set to OFF, only the specified Wiretap servers are listed in the browser.
<WiretapGatewayServer> (within <WiretapGatewayServer Group>)	String	0.0.0.0	The IP address or DNS host name for a specific Wiretap Gateway server.
<PathTranslation> (within <PathTranslationTable>)	String	0.0.0.0	Allows you to map hostnames to IP addresses, as well as to define path translation rules.
<NTSCImageAspectRatio>	Float	1.333333333333	Applies the correct aspect ratio to NTSC resolution footage rendered to the Wiretap server, but not imported from the Wiretap server.
<PALImageAsepectRatio>	Float	1.333333333333	Applies the correct aspect ratio to PAL resolution footage rendered to the Wiretap server, but not imported from the Wiretap server.
<MonitoringAndCalibration>			
<DisplayType>	Enumerated (abstract data)	LCD	Specifies the monitor display type (e.g., LCD or CRT).
<Calibration_Steps>	Integer	10	Specifies the number of monitor calibration steps performed.
<ControlSurface>			
<AutodeskPanels>	State	On	When ON, this keyword enables the Autodesk Control Surface (ACS). When OFF, Lustre enables the Tangent CP100 control surface (if applicable). You must also set the path for the control surface rules file in the Panel Setup File field.
<PanelIDs>		function="0" grading="0"	The ID numbers for the Function, Navigation, and Grading panels of the ACS.

Parameter	Data type	Default	Function
		navigation="0"	You must manually configure these keywords. If your control surface is a Tangent CP100, Lustre does not use these keywords.
<PanelIPTags>		function="101" grading="100" navigation="102"	
<ShotReactor>			
<HostName>	String		The IP address or DNS host name for a specific ShotReactor machine.
<Timeout>	Integer	5000	Sets the timeout duration (in milliseconds) of the automatic ShotReactor detection.
<Backburner>			
<Hostname>	String	localhost	The IP address or DNS host name for a specific Backburner Manager machine.
<Transcode>			
<Transcode>	String	localhost	The IP address or DNS host name for a specific WT Gateway that will be used to create and access the transcoded media.
<MatchCustomGroup>			
<MatchCustom>	Name	"AliasName" type="s"	Specifies the XML metadata field to be used by the Custom match option selected from the Browse menu. "s" represents string.
<MatchCustom>	Name	"DPXTimeCode" type="tc"	"tc" represents timecode.
<MatchCustom>	Name	"DPXkeycode" type="kk"	"kk" represents keycode.
<MatchCustom>	Name	"DPXTapeNAME" type="s"	"s" represents string.
<MatchCustom>	Name	"EDLReelName" type="s"	"s" represents string.

Parameter	Data type	Default	Function
<MatchCustom>	Name	"DL_EDLClip_name" type="s"	"s" represents string.
<MatchCustom>	Name	"DL_edlFrameID" type="i"	"i" represents integer.
<MatchCustom>	Name	"DLEDL_startTC" type="tc"	"tc" represents timecode.
<AVIO>			
<PlayoutHighSpeed>	State	Off	When OFF, it refreshes the Player as you are performing a playout. When ON, the Player is no longer refreshed and therefore the performance of the playout improves.
<WTTFirstSDLeadIn Correction>	Integer	1	Sets the delay for the SD first lead-in.
<WTTSubsequentSD LeadInCor-rection>	Integer	2	Delays all the lead-ins following the SD first shot.
<WTTSDLeadIn Increment>	Integer	0	Corrects the delay after the SD third shot.
<WTTFirstHDLedIn Correction>	Integer	0	Sets the delay for the HD first lead-in.
<WTTSubsequentHD LeadInCor-rection>	Integer	0	Delays all the lead-ins following the HD first shot.
<WTTHDLeadIn Increment>	Integer	0	Corrects the delay after the HD third shot.
<VtrTCTD>	Integer	10	The TimeCode Transition Delay specifies the number of milliseconds the application waits before asking for timecode from the VTR. The default value of 10 ms works for most decks. For HDCAM-SR decks use the following values: ■ 14, for 1080/59i/60 or 720/50/59/60 ■ 21 for other timings
<Miscellaneous>			
<DPXHeaderOffsetCheck>	State	On	When this keyword is enabled, Lustre reads the DPX / Cineon® file header of each frame in a sequence. This is useful

Parameter	Data type	Default	Function
			when using DPX/Cineon files that have a different media offset within the same sequence of files. When disabled, Lustre reads only the first frame header of a sequence. WARNING Turning this keyword on can alter playback performance.
<DisablePanScan Frame>	State	On	
<NVidiaSDISync>	State	Off	
<NVidiaPlayoutDelay>	Integer	0	
<BlockSize>	Integer	2048	
<AudioResyncTime>	Float	-1	
<LoadingSetup>	Integer	0	
<EnableKeycode Sending>	Enumerated (abstract data)	Off	
<LoginGUIGain>	Float	1.0	
<LoginGUIGamma>	Float	1.0	
<ClusterPlayDelay>	Integer	0	Available for Incinerator® only.
<ClusterSmooth Playback>	State	Off	Available for Incinerator only.
<ChangeCutOffset>	State	On	Allows the change cut or match grade feature to preserve the keyframe animations based on therecord timecode whenever a shot has been replaced or moved within a timeline. NOTE Be sure to enable only the Record button within the Match Option when performing a change cut or match grade.
<AnimCopy_UsingTrimOffset_Off>	State	On	"On" enables the first animation keyframe to load on the first frame of the shot. "Off" enables the first keyframe to be loaded according to the source frame number (and thus load with the offset).

Parameter	Data type	Default	Function
<PreallocEnable>	State	Off	Allows Burn rendering from a Lustre Windows workstation to use CXFS SAN preallocation.
<FirstFrameNumber>	Integer	On	
<StartShotFrameNumber>	Integer	On	
<DefaultDeliverablePanScanFilter>	Enumerated (abstract data)	Fast	Possible values are: ■ Fast(Lanczos2 filter) ■ Quality (Lanczos2 filter) ■ Custom (BSpline filter)
<RenderNaming> See Render Naming Settings (page 72)			
<NormalMode>	String		Normal render mode file path and token based naming convention.
<NoShotIdMode>	String		No Shot Id render mode file path and token based naming convention.
<OneSeqMode>	String		One Sequence render mode file path and token based naming convention.
<SrcGradeMode>	String		Source Grade render mode file path and token based naming convention.
<StereoNormalMode>	String		Stereoscopic Normal render mode file path and token based naming convention.
<StereoNoShotIdMode>	String		Stereoscopic No Shot Id render mode file path and token based naming convention.
<StereoOneSeqMode>	String		Stereoscopic One Sequence render mode file path and token based naming convention.
<StereoSrcGradeMode>	String		Stereoscopic Source Grade render mode file path and token based naming convention.
<NormalPadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the Normal render mode.

Parameter	Data type	Default	Function
<NoShotIdPadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the No Shot Id render mode.
<OneSeqPadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the One Sequence render mode.
<SrcGradePadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the Source Grade render mode.
<StereoNormalPadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the Steroscopic Normal render mode.
<StereoNoShotIdPadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the Steroscopic No Shot Id render mode.
<StereoOneSeqPadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the Steroscopic One Sequence render mode.
<StereoSrcGradePadding>	String		Defines the padding of the file name (the number of digits used for file numbering) for the Steroscopic Source Grade render mode.
<Debug>			
<DumpDLEDLPath>	String		Path to place the contents of a DLEDL when it is loaded in the timeline or Shot bin.
<DumpWiretapCreate Clip>	State	Off	When ON, the attributes of a Wiretap clip are placed into a log file each time a clip is created on a Wiretap server. The file <i>WiretapClipDump.log</i> is located in the Lustre home folder. Use this keyword for debugging only.
<FilmTypeGroup>			

Parameter	Data type	Default	Function
<FilmType>	Name		Various film types for AGFA, Kodak™, Eastman, and Fuji emulsions. It defines the relationship between the DPX film emulsion code and the DPX film code number.

Project Configuration

loading:projectscreating:projectsprojects:creating and loadingProjects are a means of organizing work performed in Lustre, as well as the directories where the original footage and rendered files are stored. A project typically corresponds to an entire creative piece, such as a film or commercial.

All the work you do in Lustre is non-destructive. Operations performed on the footage are saved as metadata, separate from the original footage. A render permanently applies operations to a copy of the original footage.

When creating a project, you specify a main project directory—known as *Project Home*—in which all metadata files for the project are stored. You can store footage and render files in sub-directories of the Project Home or in another location. If you store footage and renders outside the Project Home, you must specify the location when you define the project.

NOTE Before creating a project, you must have a good idea of how you will structure your data directories. See [Recommended Directory Structure for Projects](#) (page 59).

You can configure the following default settings for your project:

- Project
- Calibration
- Rendering
- Render Naming

NOTE Render Naming Settings are exclusive to Lustre 2012 Extension 1.

- Engineering
- Network Rendering

Select:	To configure:
Project	The name and location of the project. See Project Settings (page 63).
Calibration	Default system calibration settings and define the default LUTs for a project. See Calibration Settings (page 65).
Rendering	Default rendering settings for a project. See Rendering Settings (page 68).
Render Naming	Default render naming settings for a project. See Render Naming Settings (page 72).
Engineering	Default video and graphics settings for a project. See Engineering Settings (page 73).

Select:	To configure:
Network Rendering	Default Backburner/Burn®, Lustre ShotReactor, and Wiretap directory paths and settings for a project. See Network Rendering Settings (page 78).

About Project Defaults and Session Settings

When configuring your project settings in Lustre, you can configure some parameters as project defaults and others as user defaults. The parameters that are configurable as project defaults become the default settings each time a project is loaded, regardless of the logged in user. However, if you make changes in the Lustre application that affect the default settings and then save these changes to a grade file, the default settings will be overridden the next time you load the project.

While logged in, the user can override some of the project default settings, such as Render Mode in the Local menu. However, these overrides only last for the duration of the session. Restarting the application resets the settings to the values set at project creation.

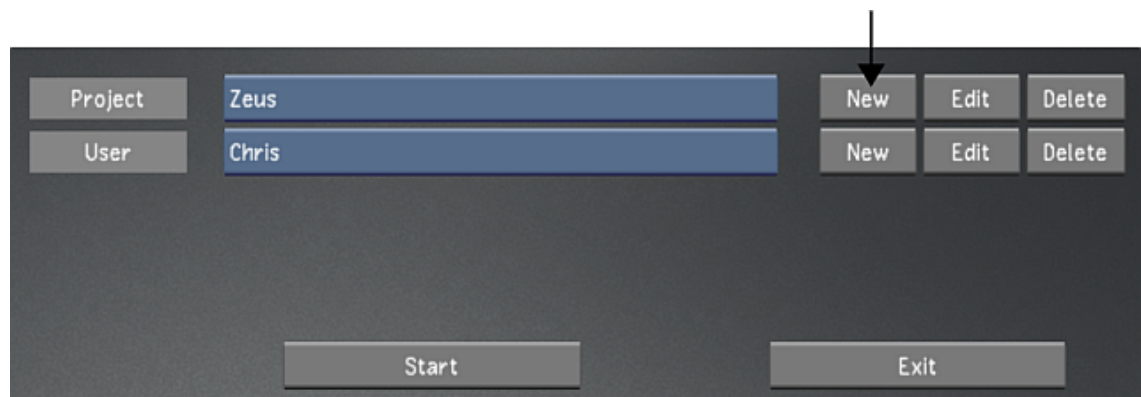
Creating a Project

Creating a Lustre project is the first step to prepare Lustre for a new colour grading project. You can use templates to accelerate project setup. See [Working with Templates](#) (page 122).

NOTE You can create multiple projects with the same Project Home. This allows you to work on a project with different settings while sharing the same scenes, cuts, and grades.

To create a new project:

- 1 Do one of the following:
 - From the Lustre splash screen, click New in the Project group.
 - From the Main menu, click Setup, then Settings, and then click New in the Project group.

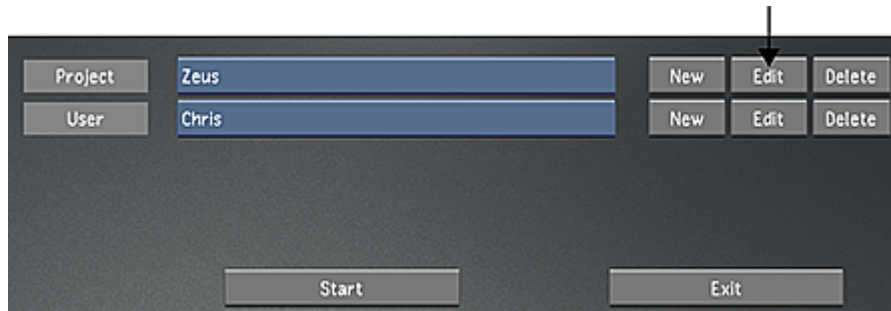


NOTE If you have a template named *default*, then its settings will be loaded automatically.

- 2 Configure the project. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).
- 3 To save the settings of the new project, click Save Project.
- 4 Click Exit Project.

To create a project based on an existing project:

- 1 Do one of the following:
 - From the Lustre splash screen, select the baseline project, and then click Edit in the Project group.
 - From the Main menu, click Setup, and then Settings. Select the baseline project, and then click Edit in the Project group.

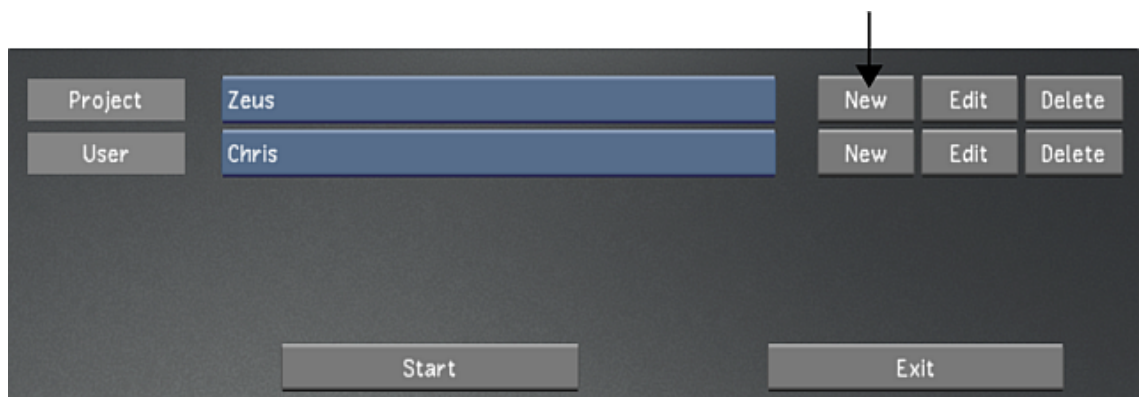


- 2 In the Project Name field, enter a new name for the new project, or you will overwrite the original project's settings with the new settings.
- 3 Configure the project. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).
- 4 To save the settings for the project, click Save Project.
- 5 Click Exit Project.

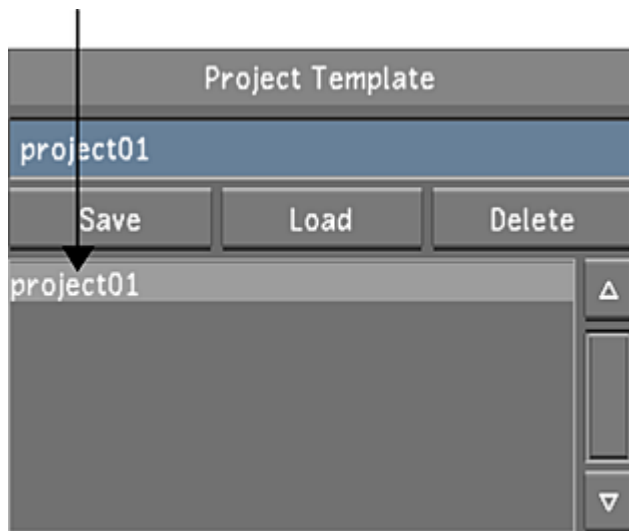
To create a new project using a template:

- 1 Do one of the following:
 - From the Lustre splash screen, click New in the Project group.
 - From the Main menu, click Setup, then Settings, and then click New in the Project group.

NOTE If you have a template named "default", then its settings will be loaded when you click New.



- 2 From the Project Template list, select a template. See [Creating a Project Template](#) (page 122).



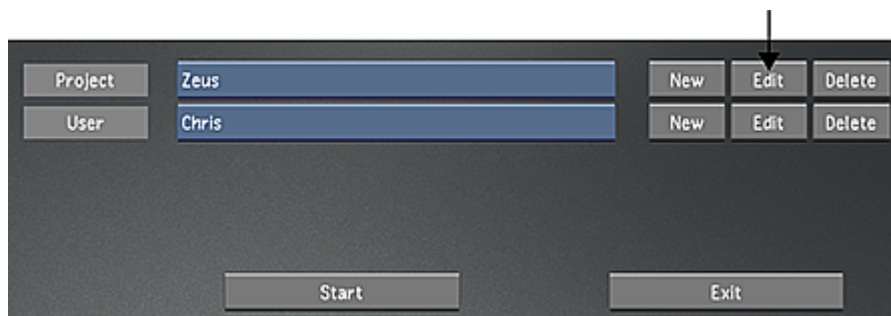
- 3 Click Load.
The template's settings are now loaded.
- 4 Configure the project. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).
- 5 To save the settings for the project, click Save Project.
- 6 Click Exit Project.

Editing an Existing Project

While working on a project, you can edit some of its default settings.

To edit the settings of a project:

- 1 Do one of the following:
 - From the Main menu, click Setup, and then Settings. Select the project to edit, and then click Edit in the Project group.
 - From the Lustre splash screen, select the project to edit, and then click Edit in the Project group.



- 2 Configure the project. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).
- 3 To save the settings for the project, click Save Project.
- 4 Click Exit Project.

Recommended Directory Structure for Projects

directories, setting up for projectsprojects:creating the directory structureThe following files can be stored per scene in the Project Home directory, or they can be stored in separate directories, as decided within the project settings. See [Project Settings](#) (page 63).

- Original footage, both full and half resolution
- Render files, both full and half resolution
- Audio
- Grade files
- Grade Bin
- Cached degrained frames
- Library: this new folder contains all the metadata created in the scene.

Project Name	Project1	
Project Home	/Storage/AllProjects/Project1	...
Scans Full Home	/Storage/AllProjects/Project1/Scans_Full	...
Scans Half Home	/Storage/AllProjects/Project1/Scans_Half	...
Renders Full Home	/Storage/AllProjects/Project1/Renders_Full	...
Renders Half Home	/Storage/AllProjects/Project1/Renders_Half	...
Project Grade Bin	/Storage/AllProjects/Project1/GradeBin	...
Degrain Cache	/Storage/AllProjects/Project1/cache	...

Example of file directory structure configuration in the Project menu

When directories are not located in Project Home, they can be located on another drive, mount point, or even on a remote SAN or file server. Select the location that best suits your hardware configuration. For example, if you work on one project at a time, you may have enough space to store all footage on the Master Station. If you are working on multiple projects, you may not have the required space on the Master Station; in this case, you could store your full scans and render files on a large remote server, and store the half-resolution scans locally.

NOTE If configuring Lustre on an Autodesk Incinerator® high-speed network, see NO LABEL .

Configuring File Locations in Project Home

When project data is stored in Project Home, the following structure is recommended during product configuration. In this example, the Project Home is defined in Windows as the *H:* drive, whereas in the Linux version it is usually defined as the */mnt/md0/* mount point.

Directory for:	Windows Folder:	Linux Directory:
Project Home	H:\<project name>	/mnt/md0/<project_name>

Directory for:	Windows Folder:	Linux Directory:
Scans	<i>H:\<project name>\<scene name>\<scans folder></i>	<i>/mnt/md0/<project_name>/<scene_name>/<scans_directory></i>
Renders	<i>H:\<project name>\<scene name>\<renders folder></i>	<i>/mnt/md0/<project_name>/<scene_name>/<renders_directory></i>
Grade bin	<i>H:\<project name>\<scene name>\<grade bin folder>\</i>	<i>/mnt/md0/<project_name>/<scene_name>/<grade_bin_directory></i>
Degrain cache	<i>H:\<project name>\<scene name>\<degrain cache folder></i>	<i>/mnt/md0/<project_name>/<scene_name>/<degrain_cache_directory></i>

Configuring Project Sub-directories

directories, setting up for projectsprojects:creating the directory structureOnce you configure file locations for your project files, you must create the sub-directories for your scans manually. Lustre generates many sub-directories automatically for specific types of file.

When you create a scene in your project, Lustre generates directories for these scenes in the project directory. Alternatively, you can manually create the scene's directory and Lustre will recognize it as an existing scene directory if you later define scenes with the exact names you gave to the directories. See [Working With Scenes](#) (page 98).

Lustre stores all project metadata in sub-directories of the project directory. The metadata is saved per scene, each scene having its sub-directory. The sub-directory is created automatically and is named *Library*.

The render directories related to the scenes are created automatically by Lustre. The directory structure differs depending on the Render Place option specified when rendering. See [Specifying the Destination for Local Render Files](#) (page 596).

In the following table, the Project Home is defined in Windows as the *H:* drive, whereas in the Linux version it is usually defined as the */mnt/md0/* mount point.

Directory for:	Windows Folder:	Linux Directory:
Scene	<i>H:\<project name>\<scene name></i>	<i>/mnt/md0/<project_name>/<scene_name></i>
Library	<i>H:\<project name>\<scene name>\Library</i>	<i>/mnt/md0/<project_name>/<scene_name>/Library</i>
Scans sub-directories associated with a shot	<i>H:\<project name>\<scene name>\<scans folder>\<shot name></i>	<i>/mnt/md0/.../<scans_directory>/<shot_name></i>
Scans at half- and full-resolution footage, which should both be at this level, in different directories. The directory name must include the scan resolution. Example: <i>2048x1556</i> . If you generate	<i>H:\<project name>\<scene name>\<scans folder>\<shot name>\<resolution></i>	<i>/mnt/md0/.../<scans_directory>/<shot_name>/<resolution></i>

Directory for:	Windows Folder:	Linux Directory:
proxies in Lustre, the proxies directory is created automatically.		
Degrain cache	<i>H:\<project name>\<scene name>\<degrain cache folder>\<resolution>\degrain_cache</i>	<i>/mnt/md0/<project_name>/<scene_name>/<degrain_cache_directory>/<resolution>/degrain_cache</i>
Degrain cache (when saved with Scans)	<i>H:\<project name>\<scene name>\<scans folder>\<shot name>\<resolution>\degrain_cache</i>	<i>/mnt/md0/.../<scans_directory>/<shot_name>/<resolution>/degrain_cache</i>
Renders	<i>H:\<project name>\<scene name>\<render mode></i>	<i>/mnt/md0/<project_name>/<scene_name>/<render mode></i>

Configuring File Locations Separately from Project Home

To have the scanned footage and renders stored on a separate storage location, the Scans Full Home and the Renders Full Home must be explicitly defined as a separate location. On Windows, an example of this separate location could be a shared folder coming from a remote file server, and mapped to the local drive G:\ under the *films\myfilm* folder. On Linux, a corresponding example would be a directory exported from a remote file server, and mounted on the */mnt/fileserver/* NFS mount point under the *films/myfilm* directory.

Directory:	Windows Folder:	Linux Directory:
Project Name	<i>H:\<project name></i>	<i>/mnt/md0/<project_name></i>
Scene	<i>H:\<project name>\<scene name></i>	<i>/mnt/md0/<project_name>/<scene_name></i>
Library	<i>H:\<project name>\<scene name>\Library</i>	<i>/mnt/md0/<project_name>/<scene_name>/Library</i>
Where you create sub-directories to store original footage	<i>G:\films\myfilm\<scans folder></i>	<i>/mnt/fileserver/ films/myfilm/<scans_directory></i>
Where Lustre creates sub-directories for render files	<i>G:\films\myfilm\grd</i>	<i>/mnt/fileserver/ films/myfilm/grd</i>

NOTE If you decide to store half-resolution scans in a different location from the originals, the project directory structure must be identical in both locations and must include the root directory of the project. For example, if the Project Home is defined as *V:\Data\Lustre_project\My_movie*, the Scans Full Home could be defined as *W:\mnt\San\Lustre_project\My_movie* and the Scans Half Home could be *X:\Lustre_project\My_movie*.

The following table shows the sub-directory structure that CEV_ProdName_CEV creates for renders. The structure differs depending on the Render Place option specified when rendering. See [Specifying the Destination for Local Render Files](#) (page 596). For the sake of simplicity, in this table, *G:\...* represents

`G:\films\myfilm\`, and `/mnt/fileserver/.../` represents `/mnt/filesever/films/myfilm` as shown in the first table in this section.

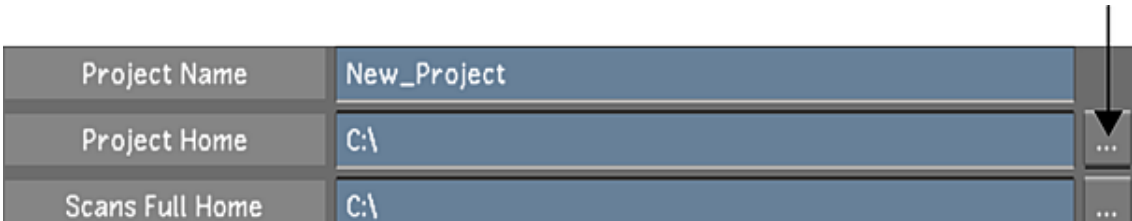
Directory:	Windows Folder:	Linux Directory:
Where sub-directories of the renders are located.	<code>G:\...\<render mode>\</code>	<code>/mnt/fileserver/.../<render mode></code>

Browsing for Paths

Instead of typing the path, you can browse for paths using the path browser.

To browse for paths:

- 1 Display the path browser by clicking '!...!'.



- 2 Using the path browser, navigate the directory structure to reach the desired directory. The selected path is automatically displayed in the path field.
- 3 To exit the browser, click Enter.

Using Environment Variables

You can use your operating system's environment variables to define all or a portion of a path. In Lustre, if you choose to use environment variables, enclose the variable name inside diamond brackets. For example, the Project Home field might be:

`<HOME>\Projects\Zeus`

Using the [PROJECT_NAME] and [USER_NAME] Variables

You can also use `[PROJECT_NAME]` and `[USER_NAME]` in your paths. You do not need to define these variables as they are predefined. The value of `[PROJECT_NAME]` is always the value you assign to Project Name in the Project settings page of Project Management. Likewise, the value of `[USER_NAME]` is always the value you assign to User Name in the Display & Interface settings page of User Management.

NOTE Both the `[PROJECT_NAME]` and `[USER_NAME]` variables require opening and closing square brackets.

The following graphic shows the use of both types of variables.

Project Name	New_Project	
Project Home	/John/Projects/[PROJECT_NAME]	...
Scans Full Home	/John/Scans	...
Scans Half Home	/John/Scans	...
Renders Full Home	/John/Projects/[PROJECT_NAME]	...
Renders Half Home	/John/Projects/[PROJECT_NAME]	...
Project Grade Bin	/John/Projects/[PROJECT_NAME]	...
Degrain Cache	/John/Projects/[PROJECT_NAME]	...

Project Configuration Settings

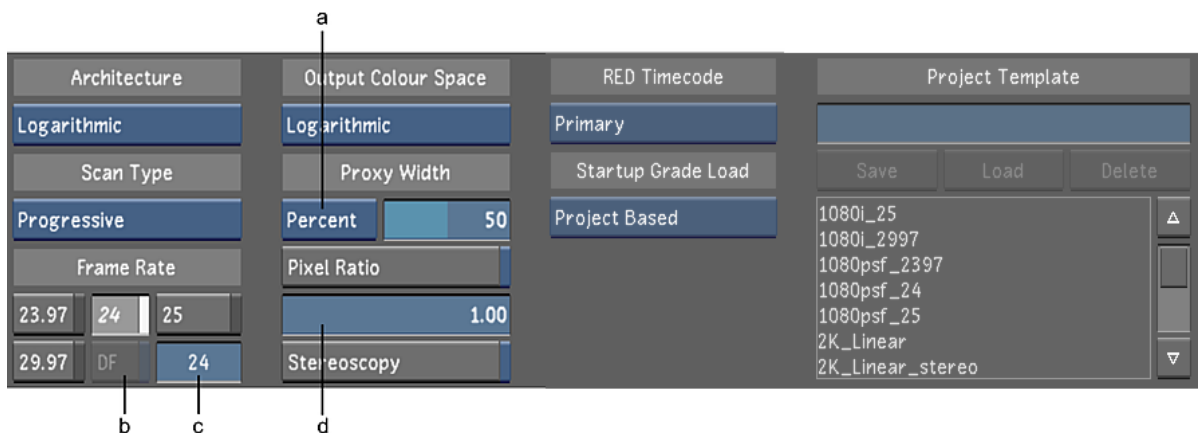
Project Settings

Use the Project settings to define:

- The Project Name
- The Project Home directory
- The Scans Home directory
- The Renders Home directory
- The Transcode Home directory
- The architecture
- The scan type
- The frame rate
- The proxy size
- The pixel ratio
- The Stereoscopy state
- The RED Timecode

For the project's directory structure, follow the guidelines described in [Recommended Directory Structure for Projects](#) (page 59). When entering a directory path, you can use the path browser. See [Browsing for Paths](#) (page 62).

Project Name	Project_1	
Project Home	/Storage/AllProjects/Project_1	...
Scans Full Home	/Storage/AllProjects/Project_1/Scans_Full	...
Scans Half Home	/Storage/AllProjects/Project_1/Scans_Half	...
Renders Full Home	/Storage/AllProjects/Project_1/Renders_Full	...
Renders Half Home	/Storage/AllProjects/Project_1/Renders_Half	...
Transcode Hires Home	[TRANSCODE_HOST]@wtg:[SCANS_FULL]	...
Transcode Proxy Home	[TRANSCODE_HOST]@wtg:[SCANS_HALF]	...



(a) Percent/Pixel option box (b) Drop Frame button (c) Frame Rate field (d) Pixel Ratio slider

Project Name field Enter the name of the project.

Project Home field Enter, or browse to, the location of the main project directory.

Scans Full Home field Enter, or browse to, the location of the scanned footage directory.

Scans Half Home field Enter, or browse to, the location of the proxy footage directory.

Renders Full Home field Enter, or browse to, the location of the render directory for renders of (full resolution) footage.

Renders Half Home field Enter, or browse to, the location of the render directory for renders of proxy footage.

Architecture option box Toggle to set the default grading architecture and colour space while working in Lustre to logarithmic or linear.

Scan Type option box Toggle to set the default scan type.

Frame Rate buttons Enable the default frame rate for the project's timeline and editing tools.

Drop Frame button Enable when your shot contains drop frames. For the majority, this button is greyed-out since most of the default frame rates do not support drop frames. This button becomes available when you select a frame rate that supports drop frames (e.g., you have selected 29.97 or you have entered a personal frame rate within the frame rate field).

Frame Rate field Displays the selected default frame rate or you can enter your own frame rate within the field.

Output Colour Space option box Toggle to set the default colour space architecture when rendering to logarithmic or linear.

Percent/Pixel option box Toggle to set whether Lustre will determine the proxy width as a percentage of the original footage, or as a fixed number of pixels.

Proxy Width slider Use to define the default proxy width. Whether it is a percentage or a number of pixels is defined by the Percent/Pixel option box.

Pixel Ratio button Enable to configure the default aspect ratio.

Pixel Ratio slider Sets the default aspect ratio. Available if Pixel Ratio is enabled.

Stereoscopy button Enable to work on a stereoscopic project.

RED Timecode option box Select which RED media timecode to transcode. Note that when conforming an EDL, overriding the timecode data of the clips with a different timecode track will prevent relinking in the Autodesk Visual Effects and Finishing applications. For more information about RED media and transcoding, see [Transcode Options](#) (page 218).

Select:	To:
Primary	Select either the Time of Day or Edgecode timecode. Only select this option if you know which timecode has been set as the primary.
Time of Day	Establish a timecode field that is set by the internal clock from the RED camera.
Edgecode	Establish a timecode field that is set by the camera operator.

Startup Grade Load option box Select the grade loading behavior at startup. Options are:

- **Never Load:** Does not load a grade at startup.
- **User Based:** Loads the last grade used by the current user.
- **Project Based:** Loads the last grade used in the project.
- **Latest Grade:** Loads the most recent grade listed in the Grades List. This is useful when working in a collaborative environment, where a colorist may work with multiple grades and exit the application when not using the latest grade version that he/she created. When the application restarts, it will load the most recent grade in the Grades List.

Project Template field Enter the name of a project template you wish to create in this field before clicking Save.

Save button Click to save the project settings of the current project to the template named in the Project Template field. Use to create a new template or to update an existing template.

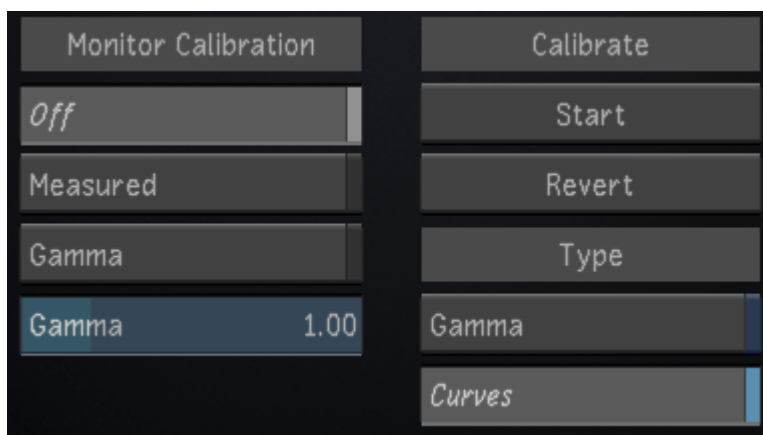
Load button Click to load a project template after you select a template in the Template Name list.

Delete button Click to delete a project template after you select a template in the Template Name list.

Template Name list Select an existing project template from this list before loading or deleting the selected template. See [Working with Templates](#) (page 122).

Calibration Settings

Use the Calibration settings to configure default system calibration settings and to define the default LUTs for a project.



Off button Enable to disable all monitor calibration settings.

Measured button Enable to apply configured monitor calibration settings.

Gamma button Enable to adjust the monitor's gamma level manually (without the use of an external colourimeter).

Gamma slider Use to increase or decrease the default gamma.

Start button Click to begin the calibration. See [Calibration and Working Space](#) (page 179).

Revert button Click to revert back to the previous automatic calibration.

Gamma button Enable to set the calibration type to 'Gamma'.

Curves button Enable to set the calibration type to 'Curves'.



Print LUT buttons Enable one of the LUT 1, 2, or 3 buttons, then select a displayed print LUT to perform a quick comparison among three LUTs. For example, to designate a LUT as Print LUT 1, enable LUT 1 and select one of the displayed print LUTs. Repeat this for LUT 2 and 3.

LUT Type menu Select the type of Print LUT: **1D Lut**, **3D Lut**, or **Colour Transform**. See [Applying LUTs for Viewing \(Print LUTs\)](#) (page 188).

Print LUT list Select a print LUT from each list after you enable one of the Print LUT buttons. You can import a LUT into the list. See [Importing a LUT File](#) (page 382).



Custom button Enable to select a custom input LUT (an input LUT other than the Log-to-Lin LUT). See [Input LUTs](#) (page 381).

NOTE If you enable Custom, make sure you also select a custom LUT in the Input LUT list.

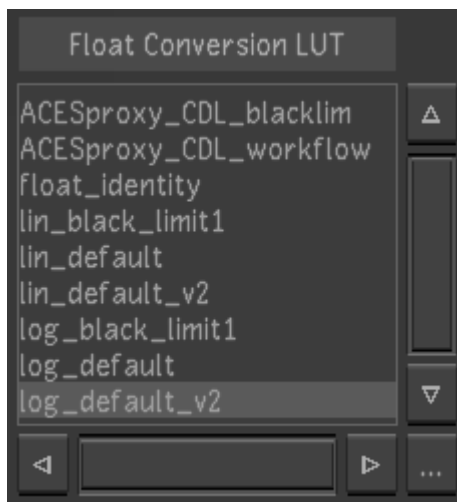
Log>Lin button Enable to configure Lustre to perform a logarithmic-to-linear conversion on shots as they are dragged into the timeline or when assembling an EDL. See [Input LUTs](#) (page 381).

Input LUT list Select a custom input LUT from this list to configure Lustre to use this LUT when:

- Dragging a shot from the Library or Browser to the timeline, or
- Assembling an EDL

You can import a LUT into the list. See [Importing a LUT File](#) (page 382).

NOTE To select a custom input LUT, enable the Custom button.



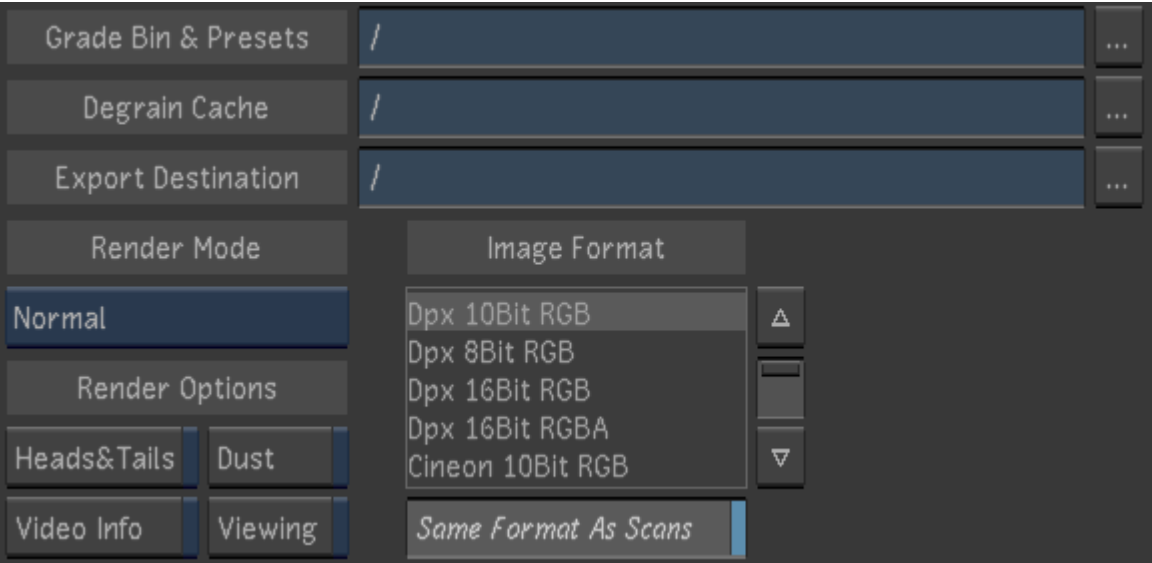
Float Conversion LUT list OpenEXR:configuringSelect a LUT to convert the OpenEXR 16-bit float data to 16-bit integer Lustre internal format. See [Working with Half Float Media](#) (page 392).

You can import a LUT into the LUT list. See [Importing a LUT File](#) (page 382).

Rendering Settings

Use the Rendering settings to:

- The Grade Bin & Presets directory.
- The Degrain Cache directory.
- The Export Destination directory.
- The Render Mode.
- The Render Options.
- The Image (Output) format.
- The Marry grade settings.
- The Dust settings.
- The Degrain settings.
- The Proxy Generation filters.
- The Reposition filter.
- The Output Lut.



Project Grade Bin field Enter, or browse to, the location of the grade files for the current project.

Degrain Cache field Enter, or browse to, the location of the user-defined cache location for degrained frames. When there is no access to the Scan directories, and the Degrain File Location option box in the Rendering menu is set to Saved with Scan, cached frames are saved in this location. See [Rendering Settings](#) (page 68).

NOTE Verify that the cache location supports the bandwidth you require for the project.

Export Destination field Enter, or browse to, the location to export to.

Render Mode Set the default render option.

Select:	To have:
Normal	Each shot of a cut rendered to a separate directory, with a Unique ID, under the render path specified in the project.
No Shot ID	Each shot in the cut rendered to a separate directory under the render path specified in the project.
One Sequence	Shots rendered into one directory as a single sequence of renamed images.
Src Grade	Individually-graded shots rendered to their own UID (unique ID) folder in the Renders Home location. This option is mostly used in the Interoperability workflow.

Heads & Tails Enable to set the project's default to render shots with head and tail frames.

Dust Enable to set the project's default to render shots with dust metadata.

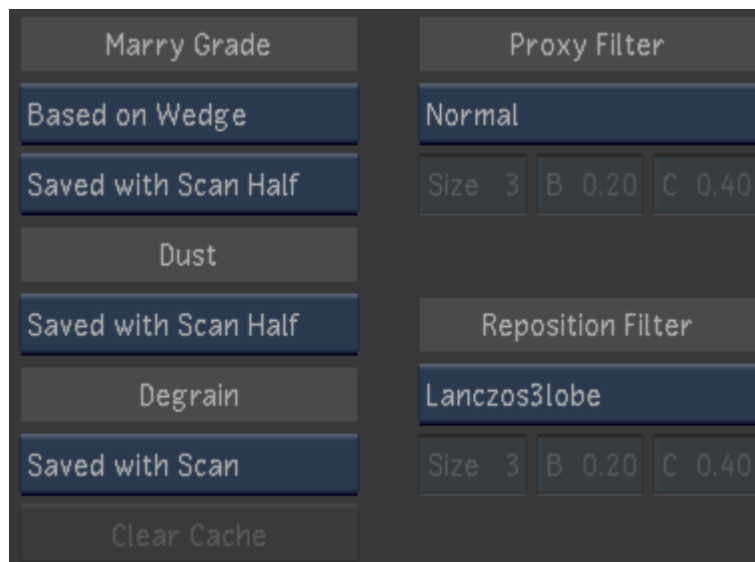
Video Info Enable to set the project's default to burn in the timecode into the render.

Viewing Select to render viewing LUT; however, it renders 8-bit BMP files. Use this option when you want to render the image displayed in the monitor.

Image Format list Select the default format of the media to be rendered from this list.

Same Format As Scans Enable to render media in the same format as the source media.

This option is disabled if the colour transform selected in Render > Output converts from floating point to integer values. This is to avoid the potential confusion that could be caused if the input scans are OpenEXR, in which case the float conversion LUT (fclut) would be applied in the viewport as usual for floating-point inputs.



Marry Grade Format option box Toggle to specify the default marry grade format. For more information about the marry grade formats, see [Saving and Loading Marry Grades](#) (page 113).

Select:	To:
Based on Wedge	Save marry grade files based on the wedge number, defined by the first and last frame in the shot's frame range.
Based on UID	Save marry grade files based on their unique identifiers.

Marry Grade File Location option box Toggle to specify the location where marry grade files are saved. Marry grades are saved in resolution-specific directories.

Select:	To save marry grade files to a resolution-specific directory:
Saved with Scan Full	Under the Scans Full Home directory.
Saved with Scan Half	Under the Scans Half Home directory.

Dust File Location option box Toggle to specify the location where Lustre saves dust files. Dust files are saved in resolution-specific directories.

Select:	To save dust files to a resolution-specific directory:
Saved with Scan Full	Under the Scans Full Home directory.
Saved with Scan Half	Under the Scans Half Home directory.

Degrain File Location option box Toggle to specify the location for caching degrained frames.

Select:	To save cached frames:
Saved with Scan	In the Scans directories.
Saved in Degrain Cache	In the user-defined Degrain Cache directory.

Clear Cache Click to delete all files in the degrain file cache. This button is disabled when the Degrain File Location option box is set to Saved with Scan.

Proxy Filter Select the default filter to use when creating a proxy.

Select:	To use as default:
Normal	An average filter if the resolution of the proxy is half, and to use a Sync filter if the resolution of the proxy is full.
CatmullRom	The CatmullRom proxy generation filter when creating proxies.
Lanczos	The Lanczos proxy generation filter when creating proxies.
Sinc	The Sinc proxy generation filter when creating proxies.

Select:	To use as default:
Mitchell	The Mitchell proxy generation filter when creating proxies. Use the sliders below to define the filter settings.

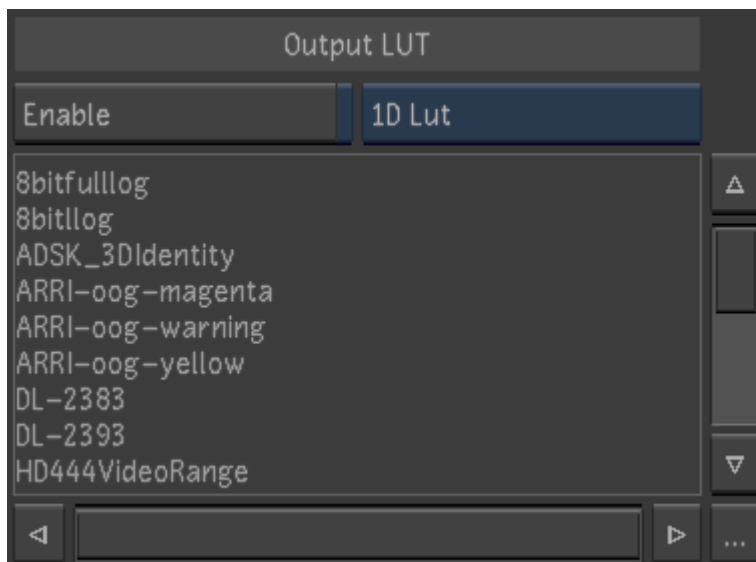
Reposition Filter Select the reposition filter to use by default when creating proxies.

Select:	To use as default:
Normal	An Average filter if the resolution of the proxy is half, and to use a Sync filter if the resolution of the proxy is full.
CatmullRom	The CatmullRom reposition filter.
Lanczos3lobe	The Lanczos3lobe reposition filter.
Mitchell	The Mitchell reposition filter. Use the sliders below to define the filter settings.

A Custom Filtering viewing option is available in the Setup / Grade menu. Custom Filtering uses the Reposition Filter, as defined here.

NOTE

- Viewing Filtering only affects what is displayed in the viewer. It does not affect rendering. In Image/Reposition menu, you can define the Filtering method that will be used for rendering, from the Image / Reposition menu. This setting does not affect how media is displayed in the viewer.
- For Real-Time Deliverables, filtering can be enabled from the Image / Reposition menu and, in this case, the Viewing Filtering is bypassed by the Image / Reposition filtering, since RTD uses the graphics card for the SDI output.



Enable button Apply the output LUT or colour transform when rendering.

Output LUT Type option Choose 1D LUT, 3D LUT, or Colour Transform.

Output LUT list Select a default output LUT or color transform to use when rendering from this list, or click the Browse (...) button at the lower right to select a file.

Render Naming Settings

Use the Render Naming Settings to configure the token based folder structure and naming conventions of rendered media. These settings are included in any project templates you create.

The project is provided with default path structures for each render mode based in the RenderNaming section of the init.config file. You can customize the folder structure and naming conventions of your renders by modifying the fields in the new Render Naming menu in the Project settings.

If you modify a render naming path for a new grade, and you load a previous grade that has a different rendering path for the same render mode, Lustre will be able to link the grade to its previously saved render path. The render naming paths are saved in the file called <grade name>.renderinfo.

Modes	Standard Render	Stereoscopic Render	Padding
Normal	[RENDERS_HOME]/Normal/[SCENE]/[GRADE_NAME]/[REEL_NAME]/[RESOLUTION]/[UID].[ORIGINAL_FILENAME].[GRADE_NAME]		.%06d
No ShotID	[RENDERS_HOME]/NoShotID/[SCENE]/[GRADE_NAME]/[REEL_NAME]/[RESOLUTION]/[ORIGINAL_FILENAME].[GRADE_NAME]		.%06d
One Seq	[RENDERS_HOME]/OneSequence/[SCENE]/[GRADE_NAME]/[RESOLUTION]/		.%06d
Src Grade	[RENDERS_HOME]/SrcGrade/[SCENE]/[GRADE_NAME]/[REEL_NAME]/[RESOLUTION]/[UID].[ORIGINAL_FILENAME].[GRADE_NAME]		.%06d

Standard Render Button Select to set standard (monoscopic) rendering.

Stereoscopic Render Button Select to set stereoscopic rendering.

Normal Field The location and naming convention for Normal renders.

No ShotID Field The location and naming convention for No ShotID renders (individually rendered shots).

One Seq Field The location and naming convention for One Sequence renders.

Src Grade Field The location and naming convention for Source Grading renders.

Padding Field Defines the padding of the file name (the number of digits used for file numbering) for each render mode. For example: <NormalPadding string=".%06d" /> will generate a six digit file like this: filename.123456.dpx.

NOTE It is possible to create a file with only a frame index (no filename), by removing the "." in the Padding Field. This is the default padding value of the One Sequence render mode.

The following tokens can be used for rendering:

- [PROJECT_NAME]: Name of the current project.
- [PROJECT_HOME]: Home folder of the project.
- [SCANS_HOME]: Location of the scans home according to the current Full or Half resolution view at the time of render.
- [SCANS_FULL_HOME]: Location of the full resolution scans.
- [SCANS_HALF_HOME]: Location of the proxy resolution scans.
- [RENDERS_HOME]: Location of the renders home according to the current Full or Half resolution view at the time of render.
- [RENDERS_FULL_HOME]: Location of the full resolution renders.
- [RENDERS_HALF_HOME]: Location of the proxy resolution renders.
- [SCENE]: Current scene name.
- [USER]: Current user.
- [RESOLUTION]: Output resolution, i.e. 1920x1080.

- [REEL_NAME]: Reel/tape name of the source clip.
- [STEREO_LAYER]: Left or Right.
- [GRADE_NAME]: Grade name (i.e grd01).
- [GRADE_NOTE]: Text data entered by user and displayed between the grade name and cut --> grd01 FinalGrade [cut01], "FinalGrade" is the grade note.
- [CUT]: Name of the cut.
- [UID]: Shot-based Unique ID.
- [ORIGINAL_FILENAME]: The original file name of the source clip (minus the extension), like "12345_clip.0000001.dpx", "12345_clip" is the file name.
- [ORIGINAL_PATH]: The original path and file name of the source clip (including the extension). Use this token to replace the source footage when rendering.

NOTE

When using the [ORIGINAL_PATH] token, the padding field is not available as the original file padding is used.

When rendering to a Wiretap destination, ie. <wiretap_server>@wt:/stonefs..., the clip names are not affected by the Render Naming convention. However, the naming of the Media files will be affected if the Wiretap Render option is enabled (i.e. media files in this case are written to a shared location as unmanaged media).

Avoid using spaces in the names you choose for your folders. Use underscores instead.

You must include the brackets when adding or modifying a token.

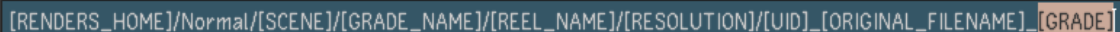
Grade-based Render Location

Each grade saves the current render naming path associated with its render mode every time you start a new render, submit a render job to Burn or ShotReactor. This means if you modify a render naming path for a new grade, and you load a previous grade that has a different rendering path for the same render mode, Lustre will be able to link the grade to its previously saved render path. The render naming paths are saved in a file called <grade name>.render<render mode>, according to the selected render mode. For example:

- grd01.renderNormal
- grd01.renderNoShotId
- grd01.renderOneSequence
- grd01.renderSourceGrade

Modifying the Render Naming

If you type an invalid token and press enter (or select another path field), Lustre will highlight the invalid token to warn you about the error.



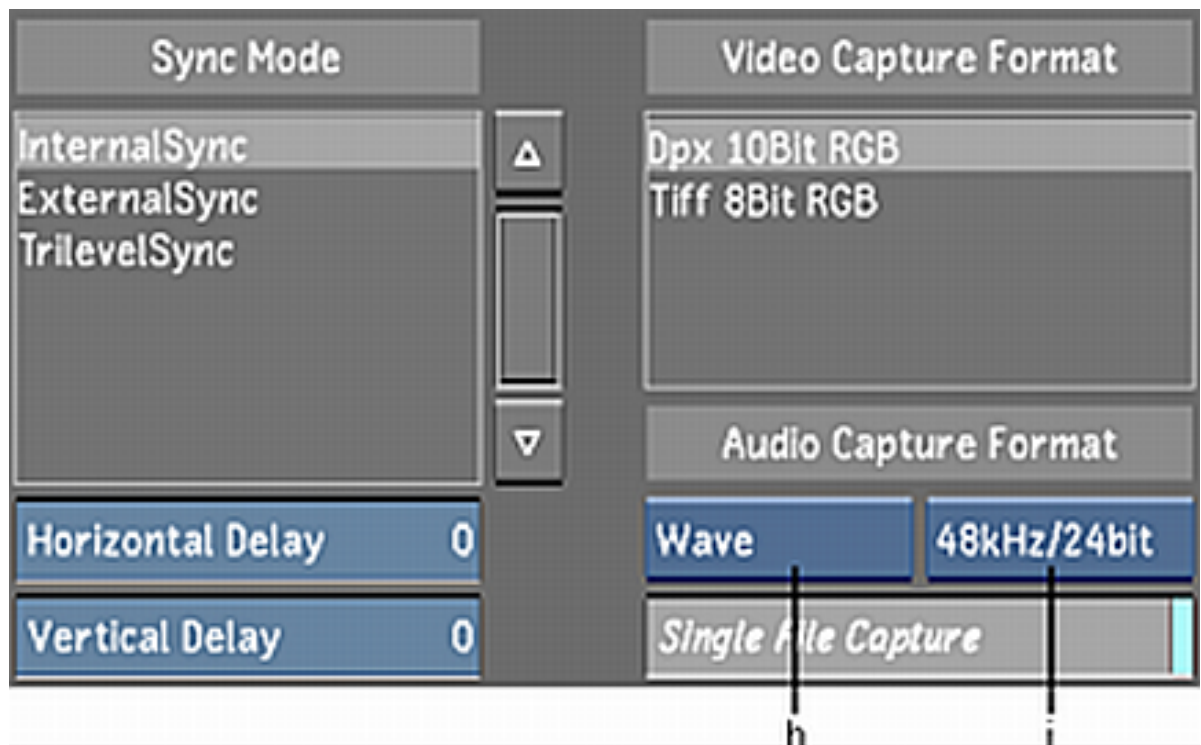
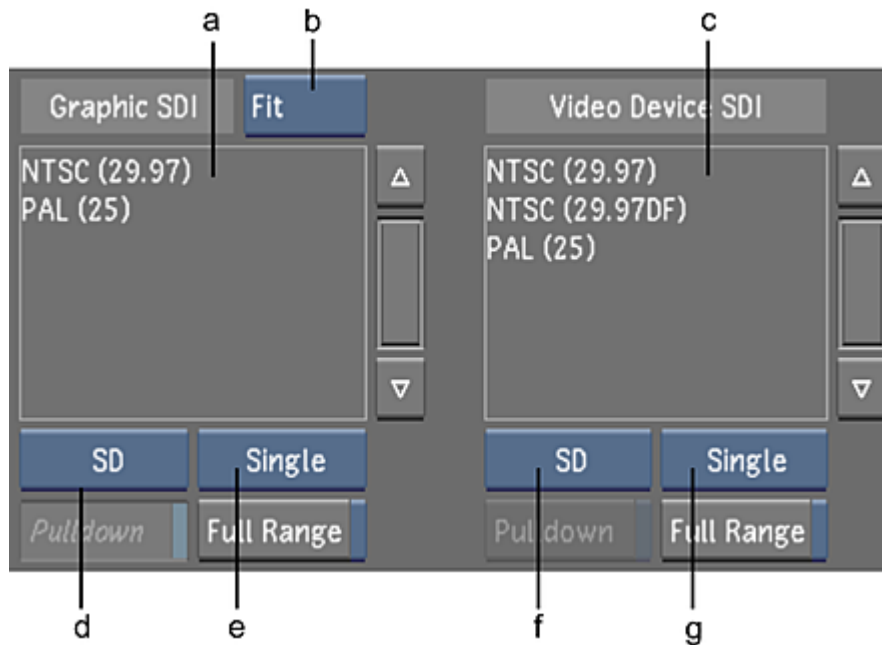
Also, after modifying a render location field, if you want to revert to the default location defined in the init.config, press the CTRL key and click on the field you want to reset.

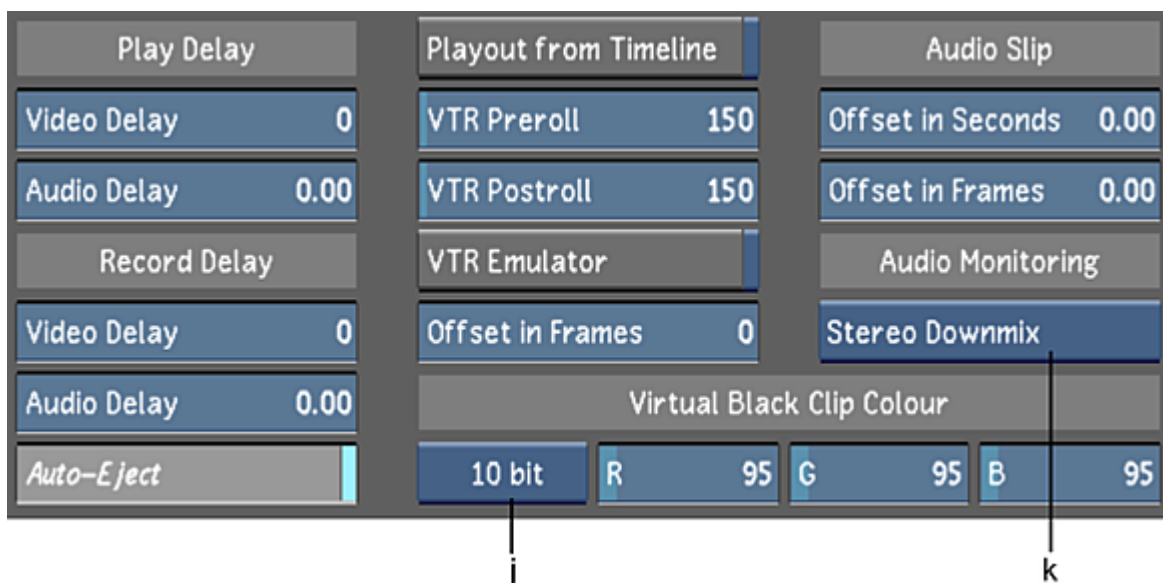
Engineering Settings

Use the Engineering settings to configure:

- Video device SDI settings

- Graphic SDI settings
- Sync mode settings
- Video capture and playout settings
- Audio capture and playback settings
- Virtual black clip colour





(a) Graphic SDI Raster list (b) Graphic SDI Display option box (c) Video Device SDI Raster list (d) Graphic SDI Format option box (e) Graphic SDI Link Type option box (f) Video Device SDI Format option box (g) Video Device SDI Link Type option box (h) Audio File Type option box (i) Audio Sampling Rate/Bit Depth option box (j) Bit Depth option box (k) Audio Monitoring option box

Graphic SDI Display option box Allows you to select how you would like to display your video on the Graphic SDI output. Cycle through the list to select one of the options.

Select:	To:
Fit	Enlarge the image as much as possible while preserving the aspect ratio at the SDI out (graphics card).
Fit W	Fit the image to the width of the monitor at the SDI out.
Fit H	Fit the image to the height of the monitor at the SDI out.
Stretch	Fit the image to the dimensions of the monitor by adjusting the aspect ratio at the SDI out (graphics card).
Center	Center the image without zooming at the SDI out (graphics card).

Graphic SDI Raster list Select one of the graphics rasters to set the default format for the graphic card's SDI output.

Graphic SDI Format option box Toggle to display, in the Rasters list, rasters using the selected resolution format.

Graphic SDI Link Type option box Toggle to display, in the Rasters list, rasters using the selected link.

Graphic SDI Pulldown button Enable to configure Lustre to add a pulldown frame when outputting through the Graphic SDI. See [About 3:2 Pulldown](#) (page 678).

Graphic SDI Full Range button Enable to configure Lustre to use the full range of YUV and RGB when outputting to the Video device SDI. When this button is disabled, Lustre uses the Normal mapping matrix for the configured video raster.

Video Device SDI Raster list Select one of the video rasters to set the default video resolution for the video device's SDI.

NOTE You must choose a video device SDI raster with the same frame rate as the graphic SDI output raster. Otherwise, the video raster will not be enabled in the application.

Video Device SDI Format option box Toggle to display, in the Rasters list, rasters using the selected footage format.

Video Device SDI Link Type option box Toggle to display, in the Rasters list, rasters using the selected link.

Video Device SDI Pulldown button Enable to configure Lustre to add a pulldown frame when outputting through the video device SDI. See [About 3:2 Pulldown](#) (page 678).

Video Device SDI Full Range button Enable to configure Lustre to use the full range of YUV and RGB when outputting to the Video device SDI. When this button is disabled, Lustre uses the Normal mapping matrix for the configured video raster.

Sync Mode list Select one of the sync mode options from this list.

Select:	To:
InternalSync	Set the sync mode to a free running internal sync (SD and HD).
ExternalSync	Genlock to analog sync connected to the sync input (SD only).
TrilevelSync	Genlock to trilevel sync connected to the sync input (HD only).

Horizontal Delay slider Use to define the number of pixels by which the horizontal sync output is delayed in relation to the incoming sync. The step interval is half a pixel for SDTV devices and two pixels for HDTV devices. The maximum delay is one line length.

Vertical Delay slider Use to define the number of pixels by which the vertical sync output is delayed in relation to the incoming sync. The step interval is +/- 1 field for SDTV devices and +/- 8 line pixels for HDTV devices. The maximum delay is one line length.

Video Capture Format list Select a video capture format to define Lustre's video capture format to a specific file type, colour space, and bit depth.

Select:	To configure Lustre to capture only:
Dpx 10Bit RGB	DPX files with an RGB colour space at a bit depth of 10 bits.
Tiff 8Bit RGB	TIFF files with an RGB colour space at a bit depth of 8 bits.

Audio File Type option box Choose whether to save audio captured from a VTR/ATR, or imported from Wiretap as a Wave (.WAV) or AIFF (.AIF) file.

Audio Sampling Rate/Bit Depth option box Select to capture the audio tracks at a sampling rate of 48 kilohertz (kHz) and a bit depth of 16-bit, or 48 kHz and a bit depth of 24-bit.

Single File Capture button When enabled, all the selected audio tracks are saved in a single file. When disabled, each audio track is saved as an individual file. This option is not available when you are importing audio from Wiretap.

Video Delay (Play) slider Define the default number of video frames to add before the start of the shot when capturing from the VTR.

Audio Delay (Play) slider Define the default number of audio frames to add before the start of the shot when capturing from the VTR.

Video Delay (Record) slider Define the default number of video frames to add before the start of the shot when recording to the VTR.

Audio Delay (Record) slider Define the default number of audio frames to add before the start of the shot when recording to the VTR.

Auto-Eject button Enable to set the project's default to automatically eject the tape during EDL capture.

Playout from Timeline button Enable to set the project's default to play out from the Output view. If this button is disabled, the playout to tape function plays out rendered material only.

VTR Preroll slider Define the time (in seconds) allowed for the VTR to run up to speed and stabilize to perform an edit.

VTR Postroll slider Define the time (in seconds) allowed for the VTR to roll after an edit.

VTR Emulator button Enable to set the project to emulate a VTR.

VTR Emulator Offset in Frames slider Define the default number of frames you wish to offset the Start Timecode from the timeline.

Offset in Seconds slider Define the default number of seconds you wish to offset the audio. See [Offsetting the Audio File](#) (page 689).

Offset in Frames slider Define the default number of frames you wish to offset the audio. See [Offsetting the Audio File](#) (page 689).

Audio Monitoring option box Toggle to select a monitoring option to make sure your playback settings correspond to your audio configuration. See [Audio Monitoring Options](#) (page 688).

Select:	Audio Device:	When:
Stereo Downmix	DVS or AJA	There are only two audio tracks that are supported on the audio monitoring device. All the odd numbered tracks (e.g., 1, 3, 5, etc.) go through port 1 and all the even numbered tracks go through port 2.
4-Track Downmix	DVS or AJA	There are only four audio tracks that are supported on the audio monitoring device.
8 Tracks	DVS only	There are up to eight tracks and each track is supported on the audio monitoring device.
8-Track Downmix	AJA only	There are only eight tracks that are supported on the audio monitoring device.
16 Tracks	AJA only	There are up to 16 tracks and each track is supported on the audio monitoring device.

Bit Depth option box Toggle to select the default bit depth of virtual colour clips in your project. Possible values are 8, 10 (default), and 16 bit.

RGB sliders Define the default colour of virtual colour clips in this project.

Network Rendering Settings

Use the Network Rendering settings to configure default Backburner/Burn, Lustre ShotReactor, and Wiretap directory paths and settings for a project.

Configuration	<i>Burn</i>	Shot Reactor	From Project
Project Home	/		...
Scans Full Home	/		...
Scans Half Home	/		...
Renders Full Home	/		...
Renders Half Home	/		...

Backburner Manager

localhost

Shot Reactor

localhost

Refresh in Seconds 1.00

Renders Full Res

Burn

Task Size

200

Priority 1

Skip Error

a

b

c

Wiretap

Local Proxy

Proxy Rendering

Render Folder

...

(a) Backburner Manager host field (b) Task Size slider (c) ShotReactor host field
Burn button Enable to display Burn render path.

ShotReactor button Enable to display ShotReactor render path. See [Network Rendering Settings](#) (page 78).

From Project button Click to copy project paths to Burn or ShotReactor.

Project Home field The location of the main project directory.

Scans Full Home field The location of the high-resolution (full) scans directory.

Scans Half Home field The location of the proxy (half) scans directory.

Renders Full Home field The location of the high-resolution renders directory.

Renders Half Home field The location of the half-resolution renders directory.

Backburner Manager Host field The IP address or host name of the Backburner Manager node. This address is read from the *init.config* file.

ShotReactor Host field The IP address or host name of the ShotReactor host. This address is read from the *init.config* file.

Refresh in Seconds slider Use to define the default number of seconds allowed to elapse before the ShotReactor progress indicator is updated.

Renders Full Res button Enable to set the default to render high resolution media when working in Proxy mode and using ShotReactor.

Task Size button Enable to configure the size of the task (in number of frames) sent to individual Burn render nodes.

Task Size slider Use to define the number of frames in each task sent to the render nodes.

NOTE You must first enable the Task Size button before configuring the size of the task with the slider.

Priority slider Use to define the default priority of a Burn task.

Skip Error button Enable to configure Lustre to skip errors when performing remote renders with Burn.

Local Proxy button Enable to generate and view, in the Half Resolution Player, the proxies Lustre creates for Wiretap media. Disable to see the proxies located on the Wiretap server.

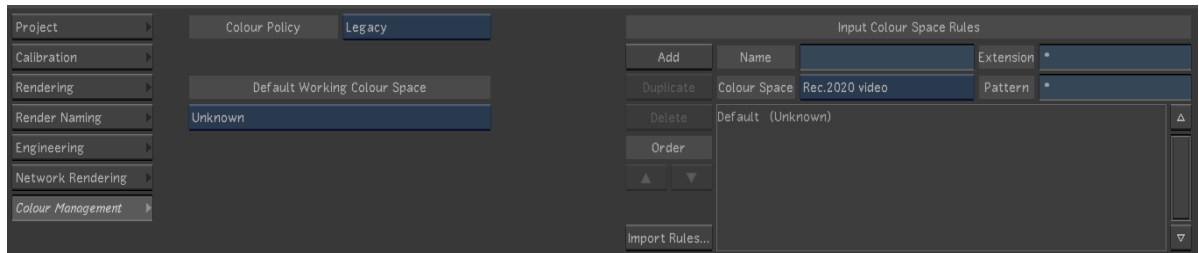
Proxy Rendering button Enable to automatically generate proxies when you render a hires timeline to the Wiretap server according to the project's Proxy Options. This makes it efficient to load clips in a Visual Effects and Finishing application as you no longer have to generate proxies first.

Render Library field Set the Wiretap location on a Visual Effects and Finishing system where Lustre creates soft-import links for the rendered shots. See [Browsing for Paths](#) (page 62).

WARNING For publish metadata to be sent to the Render Library path, the Wiretap Render button must be enabled in the Render > Local menu before you render your project.

Colour Management Settings

Project-based Colour Management Options



- Lustre 2017x1 supports Project-based Colour Management Policies and Project-based Input Colour Space Rules Options.
- You can define Colour Space rules in Lustre the same way as Flame 2017 and above.
- You can select a Colour Policy when creating or editing a project, as well as define the Default Working Colour Space. Note: In Flame Premium projects, the project policy is shared with Flame.
- Lustre Premium (as part of Flame Premium) Colour Management Policies are located in: `/opt/Autodesk/presets/(version)/synColor/policies/`. In a Lustre standalone installation, they are located in: Lustre home folder/`synColor/policies/`.
- The rules file is located in the project home/`synColor` folder. For Flame Premium projects, the rules file is shared between Flame/Flare and Lustre. The rules file is also compatible with Autodesk Maya.
- Project Templates contain the Colour Management Policy.
- You can select the Project Working Space option in Colour Management Auto-Convert mode. This option is selected by default.
- There is now a REC 2020 option when working with an UHDTV or 4K AJA raster (YCbCr). The option is located in the Engineering menu of the Capture & Playout menus (SDI Options).
- It is possible to select a different rules file from another location using the (...) button. Doing this duplicates the selected rules files and overwrites the project-based file.

NOTE

- When editing a project, the Reset All button does not reset the Color Management options since this could break the sharing of color management settings between Flame and Lustre. It is recommended to manually edit the requires options if needed.
- The `gamma/PQ_encoding_to_nits.ctf` is now used as the default for converting to the colour space used for Dolby Vision analysis. Render/Resize settings are now taken into account when calculating Dolby Vision analysis statistics, meaning that only the actual image region is used. This must be configured to prevent letterboxed areas from biasing the statistics.

For more information on Colour Management Policies, see: Flame Colour Management.

Selecting a Colour Policy When Creating a Project

When creating a project, you can select one of the provided Colour Policies shipped with the application or copy a policy from one of the listed projects.

To select an existing Colour Policy when creating a project:

- 1 Create a new project.

- 2 Go to the Colour Management tab of the Project Settings menu.
- 3 From the Colour Policy box, select a Colour Policy.

Creating Input Rules

Input Rules assign a default Input Colour Space, based on filetype and filename. When you select a preset Colour Policy, at project creation, the Input Rules associated with the profile are automatically populated. Input rules are applied in top down priority.

To create a new input rule:

- 1 From the Input Rules table of the Colour Management tab of the Project Settings menu, click Add.
- 2 Click the Rule Name field and enter a rule name.
- 3 Click the Extension field and enter a file extension, to which the rule will be applied. It is possible to use Regular Expressions as Extension. For example: [Mm][Oo][Vv] (QuickTime).
- 4 Click the Pattern field and enter a naming pattern, to which the rule will be applied. It is possible to use Regular Expressions as Patterns. Note that the whole file path is used for the matching operation. So it is possible to use a pattern contained in a sub-directory name as part of the regular expression. For example: *[Ll][Oo][Gg][Cc]* (LogC).
- 5 Select an Input Colour Space from the Input Colour Space drop-down menu.

User Configuration

loading:userscreating:usersusers, creatingIn Lustre, using user configuration, you can:

- Create a new user profile.
- Create a new user from an existing user profile.
- Create a new user from an existing user template.
- Edit the settings of an existing user profile.

Your options are:

Select:	To configure:
Display & Interface	The default display and interface settings for this user. See Display & Interface Settings (page 85).
System & Menu	The system, match grade, assemble, and playout settings for this user. See System & Menu Settings (page 88).
Tools	Keyframe interpolation, animation, dust, and colour isolation settings for this user. See Tools Settings (page 93).

About User Defaults and Session Settings

When configuring your project settings in Lustre, you can configure some parameters as project defaults and others as user defaults. The parameters that are configurable as user defaults become the default settings each time that user logs in and loads a project. However, if you make changes in the Lustre application that

affect the default settings and then save these changes to a grade file, the default settings will be overridden the next time you load the project.

While logged in, the user can override some of the user default settings. However, these overrides only last for the duration of the session. Restarting the application resets the settings to the values set at user creation.

Setting Context Parameters

projects:setting parametersparameters:setting for projectsWhen a user logs into a particular project in Lustre for the first time, Lustre creates the `<user>context.config` file, where `<user>` represents the user name associated with a user profile. The context file is found in the `C:\project\<project name>` folder in Windows and the `usr/autodesk/project/<project_name>/` directory in Linux. The context parameters include some attributes not defined in the Project or the User Management pages. They are saved and reloaded each time the context (same user and same project) applies. Contextual settings include:

- Last scene
- Last grade
- Viewing options
- Timeline settings
- Crop value
- Audio file
- State of the surface control
- Stereo sync state

Context parameters are stored in the `<user>Context.config` file. For information, see the *Autodesk Lustre Software Installation Guide*.

NOTE The `Context.config` file can be deleted by holding `Shift` and clicking the User Delete button.

NOTE It is recommended that you verify your user-level and project-level parameters in the User and Project configuration menus, prior to starting a project. See [User Configuration](#) (page 81) and [Project Configuration](#) (page 55).

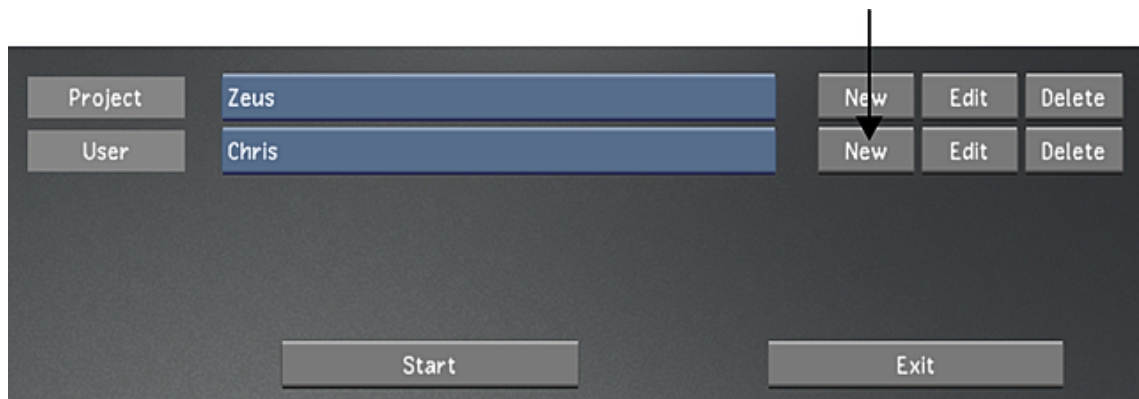
Creating a User Profile

The user settings menu allows you to customize your settings so they are used whenever you enter the Lustre application. The settings are broken down into three groups: Display & Interface, System & Menu, and Tools.

Use templates to accelerate user creation. See [Working with Templates](#) (page 122).

To create a new user:

- 1 Do one of the following:
 - From the Lustre splash screen, click New in the User group.
 - From the Main menu, click Setup, then Settings, and then click New in the User group.

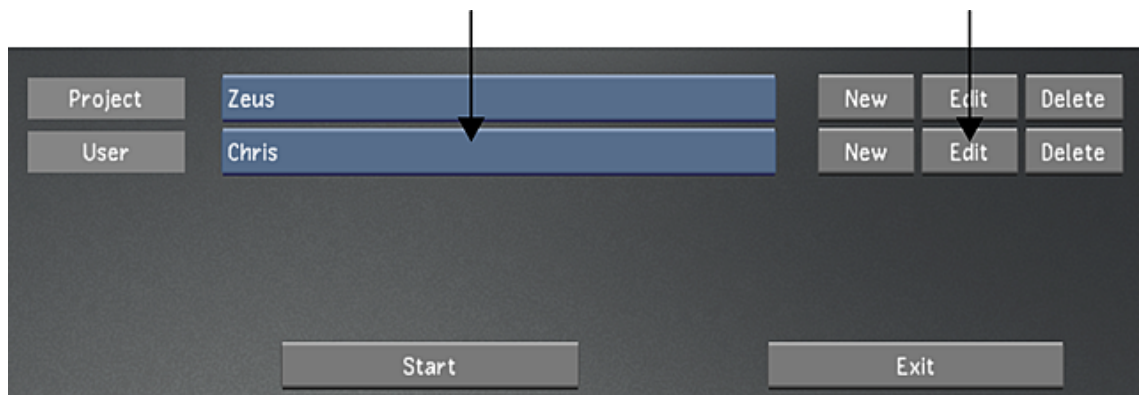


NOTE If you have a template named *default*, then its settings will be loaded automatically.

- 2 Configure the new user. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 3 To save the settings for the user, click Save User.
- 4 Click Exit User.

To create a new user from an existing user:

- 1 Do one of the following:
 - From the Lustre splash screen, select the baseline user, and then click Edit in the User group.
 - From the Main menu, click Setup, and then Settings. Select the baseline user, and then click Edit in the User group.



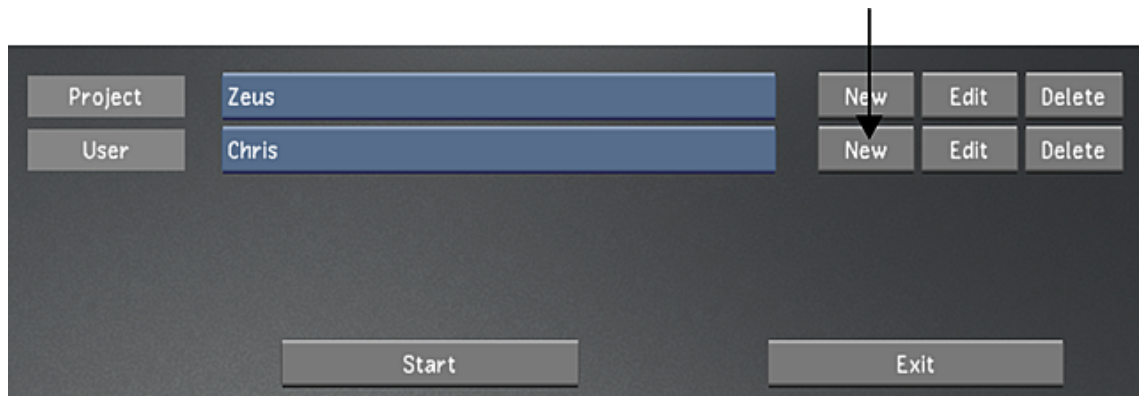
- 2 In the Project Name field, enter a name for the new project, or you will overwrite the original project's settings with the new settings.
- 3 Configure the new user. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 4 To save the settings for the user, click Save User.
- 5 Click Exit User.

To create a new user using a template:

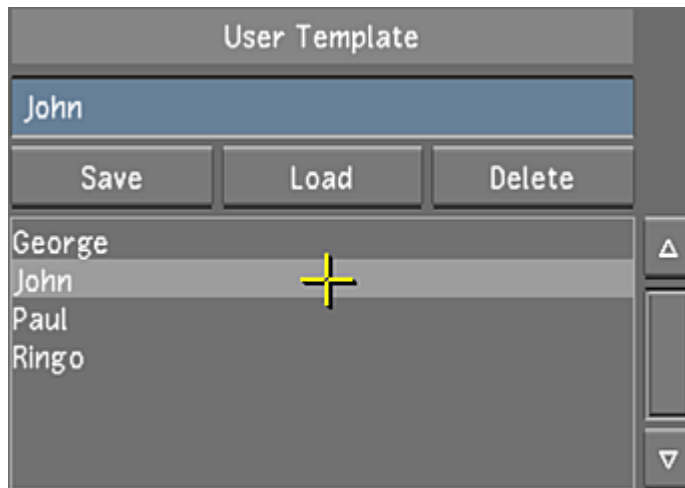
- 1 Do one of the following:
 - From the Lustre splash screen, click New in the User group. If there is a template named *default*, it will load automatically.

NOTE If you have a template named *default*, then its settings will be loaded automatically.

- From the Main menu, click Setup, then Settings, and then click New in the User group.



- 2 From the User Template list, select the template to use. See [Creating a User Template](#) (page 126).



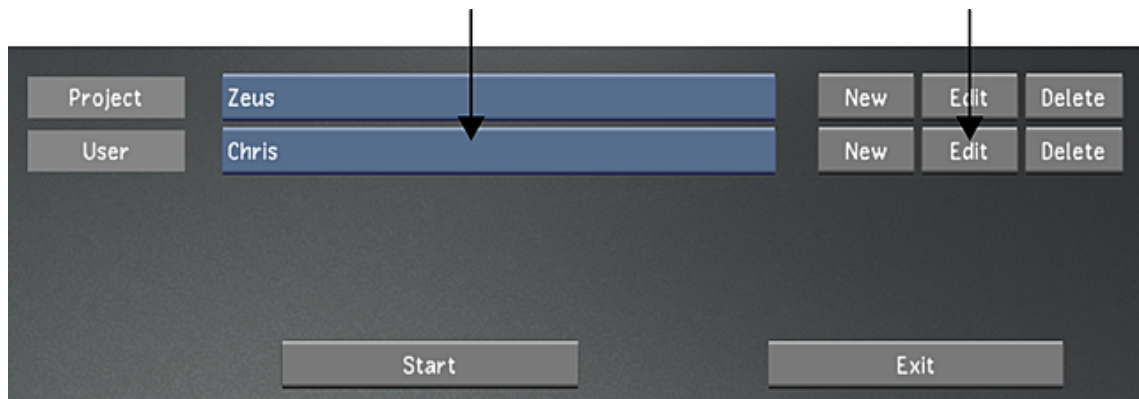
- 3 Click Load.
The template settings are now loaded.
- 4 Configure the new user. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 5 To save the settings for the user, click Save User.
- 6 Click Exit User.

Editing an Existing User

The editing feature allows you to change the settings of an existing user profile.

To edit user settings:

- 1 Do one of the following:
 - From the Lustre splash screen, select the user, and then click Edit in the User group.
 - From the Main menu, click Setup, and then Settings. Select the user, and then click Edit in the User group.



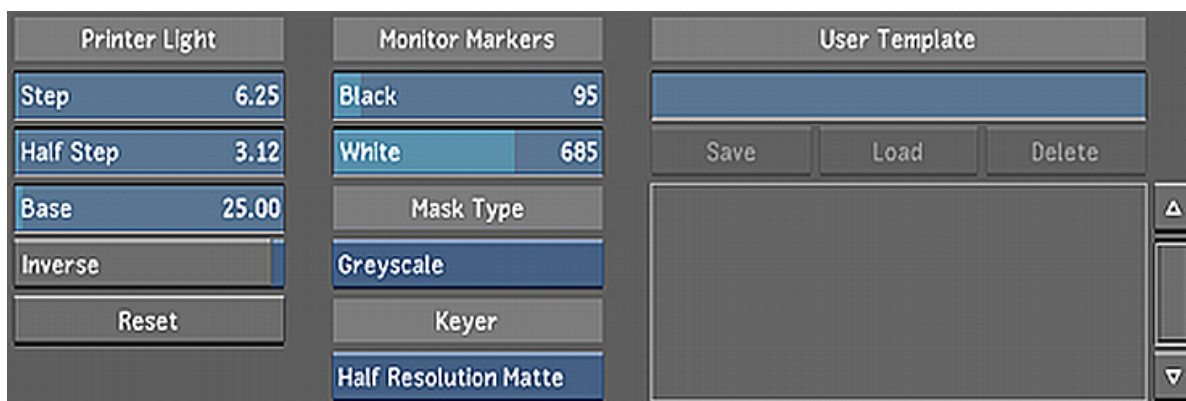
- 2 Edit the user settings. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 3 To save the edits, click Save User.
- 4 Click Exit User.

User Configuration Settings

Display & Interface Settings

This page configures display and interface settings for the current user.

User Name	Interface	Display
Cat	Gain 1.00	Keep Image Position Second Screen
Grade List Sort Order	Gamma 1.00	Centre Storyboard View Second Screen Proxies
Ascending	Background 30	Centre Big Storyboard On-Screen Display
Collapsed Frame Count	Colour Circle Angle 110	Update Storyboard Notes Flags
Timeline	Reset	Grade Bin Magnifier Size Medium
Cursor Type	GPU Auto Switch	Show Render Flag Location Bottom
Normal	Gang	Grade-Based Flags



User Name Enter your user name in this field. This name appears in the list of users after the user profile is saved.

Grade List Sort Order Sets the sort order of the Grade List:

- Ascending: From grade 001 and up (this is the default option).
- Descending: From the last grade to grade 001.

Collapsed Frame Count Sets the numbering of the counter used when working in Collapse mode:

- Timeline: Displays the counter numbering (record timecode / frame count / feet+frame) relative to the current uncollapsed timeline. This is the default option when creating a new user.
- Collapsed: Displays the continuous counter numbering (record timecode / frame count / feet+frame), based on the record timecode of the first selected shot. Frame counters start at frame 1. This is the default option used in previous versions.

Cursor Type Use to select cursor type. You can also toggle the cursor type with the `Ctrl+Enter` keyboard shortcut.

Select:	Cursor:
Normal	Displays the default yellow crosshair cursor.
Micro	Displays a yellow dot as cursor.
Transparent	Displays a transparent cursor.

Gain Sets the white point value in the user interface.

Gamma Sets the gamma in the user interface.

Background Sets the background grey in the user interface.

Colour Circle Angle Sets the colour circle angle of the grading colour wheels.

Reset button (Interface group) Reverts to default the gain, gamma, background, and colour circle angle.

GPU Auto Switch Disables the GPU processing when using features not supported by the GPU.

Default Group Mode Sets the default state of the Solo / Gang Group mode.

Keep Image Position Maintains the image position in the display when you access the Player. When disabled, the image centres itself in the Player when you hide the user interface.

Centre Storyboard View Enables centering the selected shot in the Storyboard.

Centre Big Storyboard Enables centering the selected shot when you are viewing the Storyboard in the large Storyboard view.

Update Storyboard Enables the automatic update the Storyboard thumbnails whenever you make changes to your shot.

Grade Bin Magnifier Enable to magnify the thumbnail in the Grade bin when the mouse cursor is over a storage container.

Show Render Flag Enable to display the render flag in the upper-left corner of the screen. You can use the Render Flag hotkeys ([&]) to enable or disable, respectively, any selected flag. In the Flag List, a [] icon is located next to the Flag Visibility. By default, this icon is set on the Render Flag but clicking on the left of any Flag Visibility will set the Flag on/off keys to the Select Flag.

Grade-Based Flags / System-Based Flags Use to define if the flags of a grade are propagated to the system-level flags system.

The two choices are:

- **System-Based Flags:** When loading a grade that contains flags, these flags are automatically added to the system-level flag file (located in the home of the application). This means that all projects have access to the flags. This is the default state when creating new user settings.
- **Grade-based Flags:** When loading a grade that contains flags, these flags are only available when using this grade or when creating a new version of this grade.

Second Screen / Second Screen Proxies Second Screen is disabled by default. Enables the broadcast to a web browser on another device so that clients attending a grading session can follow what the colorist is doing. For the client to use it, point a browser to `http://<workstation ip address>:8888`. The user name and password are both `lustre`. Enable Private Browsing in Mobile Safari, on IOS devices, to make sure the web page is properly refreshed. The client must be on the same network as the Lustre web server. The web server is managed by Lustre, so when you start or exit Lustre, the web server starts / stops. It displays currently-loaded grade and cut metadata (text only), see updated storyboard thumbnails and view shot metadata. Lustre Second Screen can also display the metadata of a single shot, regardless of whether it is the current shot or not. Notes information can also be displayed. It is also possible to display the current shot in Shot View by clicking the Follow Current Shot link. This displays the current shot in Shot View. Clicking a thumbnail displays shot information, including notes. Clicking Back To Storyboard, brings you back to the main page. Second Screen Proxies is disabled by default, in which case only text information is provided on the web server page. Enable to broadcast the storyboard thumbnails. In this case the frame used in the Lustre Storyboard is shown and any modifications are automatically reflected in the storyboard.

Notes Enable the display of Notes for On-Screen Display.

Flags Enable the display of Flags for On-Screen Display.

Size menu Select the size of displayed elements for On-Screen Display.

Location menu Select the location of displayed elements for On-Screen Display.

Step Use to set the value for one lab light.

Half Step Use to change the value for half a lab light.

Base Sets the default value for your printer light settings (i.e. red, green, blue (RGB) values).

Inverse Enable this button in the Printer Light group to invert the printer light density mode.

Reset button (Printer Light group) Click to revert the step, half step, base, and inverse settings to their default value.

Black Defines the values of the lines set in the histogram and waveform monitor for black.

White Defines the values of the lines set in the histogram and waveform monitor for white.

Mask Type option box Defines the default display mode for the F11 hotkey and the Matte (M) button in the View mode panel.

Select:	To display mattes:
Greyscale	In Greyscale mode. This Mask Type is referred to as Matte view.
Overlay	In Overlay mode. The matte is displayed in its original colour and the unselected region of the matte is overlayed with a uniform colour. This Mask Type is referred to as Secondary view.

Keyer Matte Resolution option box Select the default Keyer matte resolution. Your options are:

- Full Resolution Matte
- Half Resolution Matte

User Template Enter the name for the template you are creating. See [Working with Templates](#) (page 122).

Save Click this button to save the user settings to the template named in the User Template field.

Load Loads the user template selected in the User Template list.

Delete Deletes the user template you have selected in the User Template list.

User Template list Displays a list of all the user templates which have been created for Lustre.

System & Menu Settings

Use the System & Menu Settings page to configure the backup options, change shot settings, assemble options, match options, playout settings and background render user preference as well as the panel setup file and the user grade bin and presets directory for this user.

Autosave		History	
Autosave (min)	10	Backup	
Scene Consistency		Change Shot	
AutoCheck		None	
Auto Reparse		Keep Current Grade	
Print View Reparse		Editing While Grading	
Message History		Next Shot Navigation	
Max Messages	100	Go to Next Shot	

Assemble		Match Options	
Auto Cleanup		UID	Source
Auto Match		Record	Custom
Match Grade		Strict	Compare first 7
To Layer	Dissolve	EDLReelName FolderReelName DPXReelName DPXKeyCodeStart DPXKeyCodeEnd DLEDLClipName DLEDLOrigin	
Use Reel Name			
Use DPX Reel			
Auto Load CDL/SDL			

Playout	Shot Reactor	Burn
Bars Length	Online	
00:00:05:00	Automatic	Degrain Only
Black Length	New Job	Start Last
00:00:05:00	Degrain Only	Open Home At Start
Grade Bin & Presets	/usr/discreet/user/grading/[USER_NAME] ...	
Panel Setup File	/usr/discreet/user/grading/[USER_NAME]/acs.rules ...	
Tangent Setup Folder	/usr/discreet/user/grading/[USER_NAME]/precise ... Alt-Precise	

Autosave slider Use to define, in minutes, the frequency with which Lustre automatically saves a backup of the grade and cut you are working on.

Scene Consistency option box Toggle to verify inconsistencies in the file metadata when loading.

Select:	To:
AutoCheck	Check the cut files when loading to look for inconsistencies in the metadata. Results are printed out to the console window.
AutoRepair	Perform the same task as above but additionally, to repair all inconsistencies.
None	Disable the Scene Consistency function in Lustre.

Auto Reparse button Enable to force Lustre to reparse the project structure and source material at start-up.

Print View Reparse button Enable to have Lustre reparse the project structure and source material in Print View.

Message History slider Use to define the number of system messages which Lustre will save in its message history.

NOTE Message History is exclusive to Lustre 2012 Extension 1.

History button Enable to create a history file for each grade whenever you save the grade. Any subsequent grade that you save will also save the cut and grade files to a unique *<grdxx_bak>* backup directory, which is automatically created in the current scene's library sub-directory in the Project Home location. The backup directory name has the same name as the grade.

Backup button Enable to save a copy of the current grade metadata on the system disk. If you save over your current grade, or save a new grade, a backup copy of all the grade metadata from your current grade is saved in a folder named *backup* that is automatically created in the default location where Lustre is installed (*C:\Program Files\Autodesk\Lustre<version>* for Windows or *usr/autodesk/lustre_<version>* for Linux).

NOTE When History is enabled along with Backup, all the cut and grade files from the history backup will also be saved in the system *backup* folder.

Change Shot option box Toggle to define the change operation settings.

Select:	To:
Do	Force a Do operation after moving to another shot.
DoAndClearUndo	Force a Do operation and delete the undo buffer after moving to another shot.
None	Do nothing when moving to another shot.
ClearUndo	Delete the undo buffer after moving to another shot.

Keep Current Grade button Enable to configure Lustre not to remove a current grade from memory when loading a scene.

Editing While Grading button Enable to make editing hotkeys available when you are in the colour grading menus.

Next Shot Navigation button Use to select the default Next Shot Navigation mode. Options are:

- **Shot Reactor Automatic & Manual mode:** The behaviour of Shot Reactor can now be defined in the User preferences. From the User / System & Menu / Shot Reactor menu (or from the Render / ShotReactor menu), you can select between:
 - **Automatic:** When moving from shot to shot, Lustre automatically sends the previous shot to Shot Reactor (if Shot Reactor Rendering and the Changed Flags are enabled). This is the default behaviour.
 - **Manual:** In this mode, you manually send shots to Shot Reactor using the following keyboard shortcuts:
 - **Alt+X:** Enable / disable Shot Reactor Rendering.
 - **Shift+X:** Send the current or selected shots to Shot Reactor. This keyboard shortcut is available in both Automatic and Manual modes.
 - **Ctrl+X:** Clear the Shot Reactor queue.

NOTE When working in Manual mode, it is recommended to set the New Job User setting to Start Next (rather than the default Start Last) for the rendering to be performed in the same order as the Timeline.

- First Frame
- Middle Frame
- Last Frame
- First/Last Frame
- First/Mid/Last Frame

Using the **Ctrl+Alt+Right Arrow** keyboard shortcut, you can cycle through the different navigation mode. A message showing the current navigation mode is displayed in the Shot Time Bar.

You can also perform alternate navigation, by holding **Alt** while pressing the arrow key (or the Next shot button on the panel). The alternate navigation is as follows:

Navigation Mode:	Becomes:
First Frame	Last Frame

Navigation Mode:	Becomes:
Middle Frame	First/Mid/Last Frame
Last Frame	First Frame
First/Last Frame	Middle Frame
First/Mid/Last Frame	First Frame

Auto Cleanup button Enable to automatically perform cleanup during an EDL assembly. When Lustre performs an EDL cleanup, it arranges EDL events according to record timecode and deletes problematic events. For example, if an EDL has two events with conflicting timecodes, the event with the lower number is deleted during cleanup.

Auto Match button Enable to automatically match EDL event timecodes to available shot timecodes in the Library during assembly.

Match Grade button Enable to apply the current grade settings to a new assembled timeline without having to create a new cut file and use the Change Cut option.

To Layer button Enable to assemble a cut to a new layer above the existing layer(s) in the currently loaded cut.

Dissolve button Enable to include all dissolves in the EDL. If this button is disabled, dissolves are not part of a timeline after the EDL assembly.

Use DPX Reel button Enable to match the EDL reel name to the reel name in the DPX header during an EDL assembly.

Auto Load CDL/SDL Enable to allow CDL and SDL support when conforming an EDL. From the Editing / Assemble menu, you can hold Ctrl while pressing the CDL/SDL Load options (All or Selected) to apply the selected match options. By default, CDL/SDL support uses the record timecode for matching. However, for EDLs that do not have the same structure as the sequence in Lustre, you can use the Source Match options to load CDL/SDL data to the corresponding shots in the sequence. You can use the Match Options, in the Editing / Browse menu, to define the matching criteria for CDL matching.

UID button Enable to configure matching to be based on the shot's unique ID during EDL assembly.

Source button Enable to configure the matching to be based on the source data, such as a shot's source timecode, during an EDL assembly.

Record button Enable to configure the matching to be based on the record data, such as an EDL's record timecode, during an EDL assembly.

Custom button Enable to use one of the cut file's metadata as matching criteria during EDL assembly.

XML Tag Options list Select one of the cut file's metadata from this list to use as a matching criteria during an EDL assembly. You must enable the Custom button before performing this operation.

Bars Length slider Use the slider to define the default minimum colour bars length when recording in Record mode.

Black Length slider Use the slider to define the default black length time when recording in Record mode.

ShotReactor Online button Enable to automatically enable Lustre ShotReactor when starting Lustre.

ShotReactor Mode button Use to select the ShotReactor operation mode. Options are:

- **Automatic:** When moving from shot to shot, Lustre automatically sends the previous shot to Shot Reactor (if Shot Reactor Rendering and the Changed Flags are enabled). This is the default behaviour.
- **Manual:** In this mode, you manually send shots to Shot Reactor using the following keyboard shortcuts:
 - **Alt+X:** Enable / disable Shot Reactor Rendering.
 - **Shift+X:** Send the current or selected shots to Shot Reactor. This keyboard shortcut is available in both Automatic and Manual modes.
 - **Ctrl+X:** Clear the Shot Reactor queue.

NOTE When working in Manual mode, it is recommended to set the New Job User setting to Start Next (rather than the default Start Last) for the rendering to be performed in the same order as the Timeline.

ShotReactor Job Priority toggle Set the ShotReactor job priority. Set to Start Next, to place ShotReactor renders next in the queue. Set to Start Last, to place ShotReactor renders at the end of the queue.

ShotReactor Degrain Only button Enable to set the default state of the Degrain Only button in the Render / ShotReactor menu. When this option is enabled, the shot will be rendered with only the Degrain data applied. For more information on Lustre Shot Reactor, see: [Rendering Shots as You Work](#) (page 607).

Burn Degrain Only button Enable to set the default state of the Degrain Only button in the Render/ Backburner menu. When this option is enabled, the shot will be rendered with only the Degrain data applied.

Open Home At Start button Enable to set the file browser to display the contents of your project's Scans Full directory at start-up.

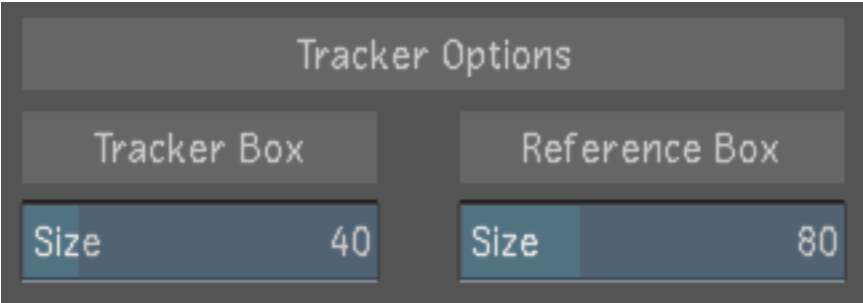
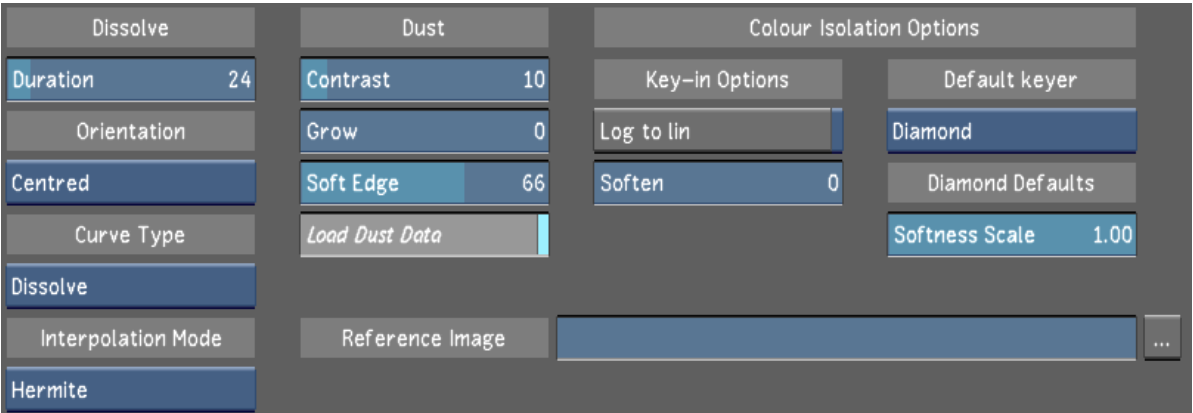
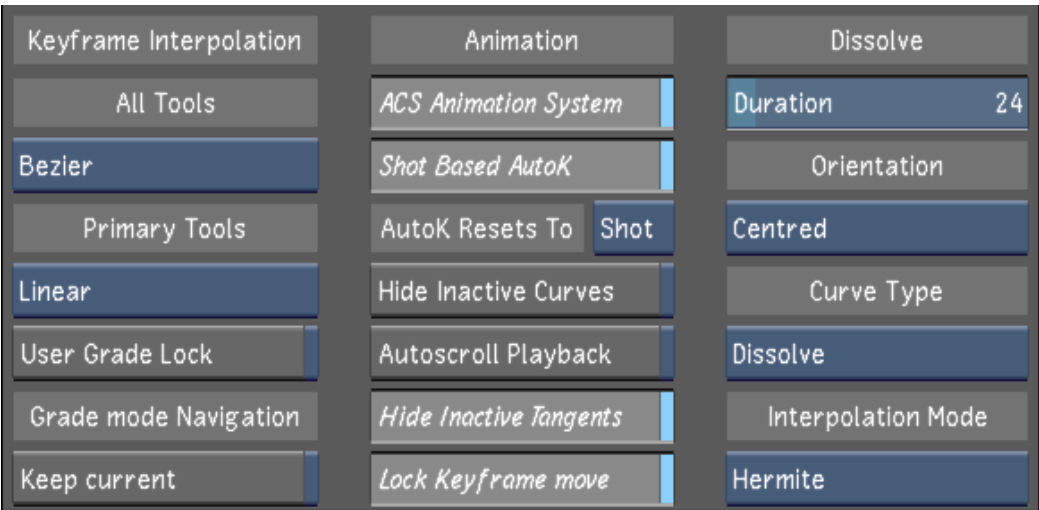
User Grade Bin & Presets Home field Enter, or browse to, the location of the grade files and presets for the current user. The default path for these files is the User folder of the application. For information about defining paths, see [Browsing for Paths](#) (page 62).

Panel Setup File field Enter, or browse to, the location of the control panel rules file. The default path for this file is the User folder of the application. For information about defining paths, see [Browsing for Paths](#) (page 62).

Tangent Setup Folder field Enter, or browse to, the location of the Tangent panel setup folder. The default path for this file is the User folder of the application. For information about defining paths, see [Browsing for Paths](#) (page 62).

Tools Settings

Use the Tools Settings page to configure keyframe, animation, dissolve, dust, colour isolation and reference image settings for this user.



All Tools option box

Toggle to select the default keyframe interpolation mode for all tools, except the input and output primary grading.

NOTE The settings in the All Tools sub-group do not affect tools in the Colour > Grading menu.

Select:	
Linear	Select to use a linear default interpolation for all tools. The linear interpolation joins keyframes with a straight line. This affects all parameters (other than the input and output primary grading) in the Colour menu.

Select:	
Bezier	Select to make the default interpolation for all tools to be Bezier. The bezier interpolation produces a smooth curve with a smooth transition between keyframes and each keyframe on the curve has tangent handles. This affects all parameters (other than the input and output primary grading) that are in the Colour menu.
Constant	Select to use a constant default interpolation for all tools. Constant interpolation produces a square curve. This affects all parameters (other than the input and output primary grading) in the Colour menu.
Hermite	Enable to make the default interpolation for all tools Hermite. Hermite interpolation produces a smooth curve with a smooth transition between keyframes. This affects all parameters (other than the input and output primary grading) in the Colour menu.

Primary Tools option box

Toggle to select the default keyframe interpolation mode for all primary grading tools.

Select:	
Linear	Select to use a linear default interpolation for all primary grading tools. The linear interpolation joins keyframes with a straight line. This affects all parameters within the Colour menu for input and output primary grading.
Bezier	Select to make the default interpolation for primary grading tools to be Bezier. The bezier interpolation produces a smooth curve with a smooth transition between keyframes and each keyframe on the curve has tangent handles. This affects all parameters within the Colour menu for input and output primary grading.
Constant	Select to use a constant default interpolation for all tools. Constant interpolation produces a square curve. This affects all parameters within the Colour menu for input and output primary grading.
Hermite	Select to make the default interpolation for primary grading tools Hermite. The hermite interpolation produces a smooth curve with a smooth transition between keyframes. This affects all parameters within the Colour menu for input and output primary grading.

User Grade Lock button Enable to lock the currently loaded grade when working in Lustre. This is handy when working in a collaboration workgroup where multiple users work with the same content. With this option enabled, the currently loaded grade cannot be overwritten.

Grade Mode Navigation You can enable the Keep Current button to preserve the current grading stage of shots (Primary, Secondary, etc.) as you navigate. This means that when you navigate back to a shot, the last grading stage is automatically recalled.

ACS Animation System button Enable to have Lustre mimic the behavior of the ACS panel when animating from the user interface. Using the ACS Panel, Lustre automatically updates the first keyframe in your timeline whenever a keyed parameter is modified before the first keyframe or the last keyframe in your timeline whenever a keyed parameter is modified after the last keyframe.

Shot Based Auto Key button Enable to activate the Auto-key button on a shot basis rather than having AutoKey active for all the shots.

Hide Inactive Curves button Enable to hide animation curves that are not in use. Hiding inactive curves can make it easier for you to manage your keyframes and modify your animations.

Autoscroll Playback button Enable to configure Lustre's default behaviour to scroll automatically when the positioner plays off the edge of the Channel Editor or Timeline.

Hide Inactive Tangents button Enable to hide tangent handles for keyframes that are not selected.

Lock Keyframe move button Enable to allow only vertical movement when dragging a keyframe.

NOTE You can temporarily override locked movement by holding down the Shift key and dragging the keyframe horizontally. If you want to move the keyframe without any restrictions, disable the Lock Keyframe Movement button.

Duration Slider Use to set the default duration, in frames, of dissolves.

Orientation option box Toggle to select Centered, From Cut or Up To Cut as the default orientation of dissolves.

Curve Type option box Toggle to select Dissolve or Blend as the default curve type for dissolves.

Interpolation Mode option box Toggle to select Constant, Linear, Hermite or Bezier as the default interpolation mode for dissolves.

Contrast slider Use to set the amount of contrast used to find dust during automatic analysis. Low contrast values cause the algorithm to accept low colour value differences between corresponding pixels on the current, previous, and next frames. Therefore, low values result in more complete removal of the artefact. However, if the contrast is set lower than actually needed, adjacent pixels are modified more than actually required to remove the dust.

Grow slider Use to control the number of pixels around the pixels detected by Lustre.

Soft Edge slider Use to soften the stroke of the pixels specified by the Grow slider in order to replicate a natural paint stroke.

Load Dust Data button Enable to load the dust removal metadata after you have already loaded the grade.

Reference Image field Enter, or browse to, the path of the reference image. Then, you can press **Shift+K** to load the image into the single file system for reference and then view the image by pressing **L**. For information about defining paths, see [Browsing for Paths](#) (page 62).

Log to Lin button Enable to apply colour transformation prior to keyer input processing.

Soften slider Use to reduce image grain and noise and to keep edges intact prior to keyer input processing.

Default keyer option box Toggle to select the Diamond Keyer or the HLS Keyer as the default keyer in the secondary menu.

NOTE The default keyer setting only applies to ungraded shots and unused secondaries. A loaded grade file has priority over this setting. This means that the keyer that was used to grade a shot or modify a secondary is the keyer that will be displayed.

Softness Scale slider Use to adjust the scale of the Softness Diamond on the hue cube for the Diamond Keyer.

Tracker Options Define the default size of Tracker and Reference boxes.

Tracker Box slider Use to define the default size of Tracker boxes.

Reference Box slider Use to define the default size Reference boxes.

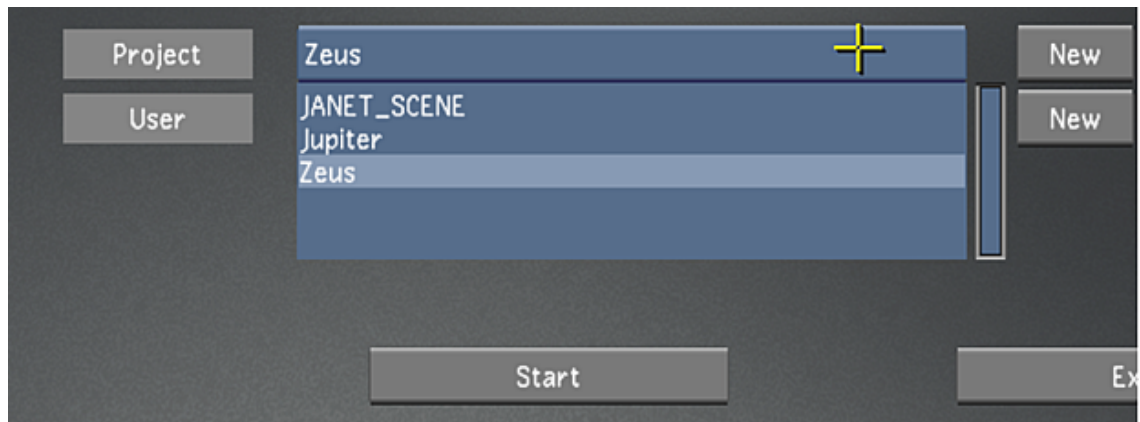
Loading Users and Projects

After creating a project and defining users, you can start using it. You do so by loading a project and selecting a user profile. This can be done from the Lustre splash screen, or from an already started session.

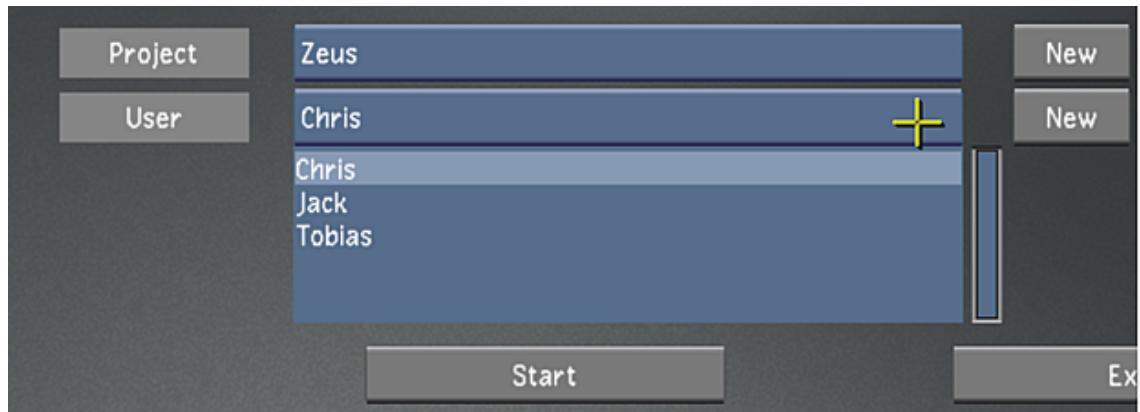
NOTE When you are already in a Lustre session, you can change both the user and the project independently.

To load a project from the Lustre splash screen:

- 1 Select a project in the Project list.



- 2 Select a user in the User list.



- 3 Click Start.

To load a project or a user during a Lustre session:

- 1 From the Main menu, click Setup, and then Settings.
- 2 (Optional) To load a project, select a project in the Project list and click Load in the Project group.



- 3 (Optional) To load a user, select a user in the User list and click Load in the User group.

Project	Zeus	New	Edit	Delete	Load
User	Chris	New	Edit	Delete	Load

- 4 Leave the Settings menu to start working on the loaded project using the loaded user profile.

Working With Scenes

A scene is used to organize your libraries within a given project. A scene called "default" is automatically created with every new project. You can create as many scenes as needed per project.

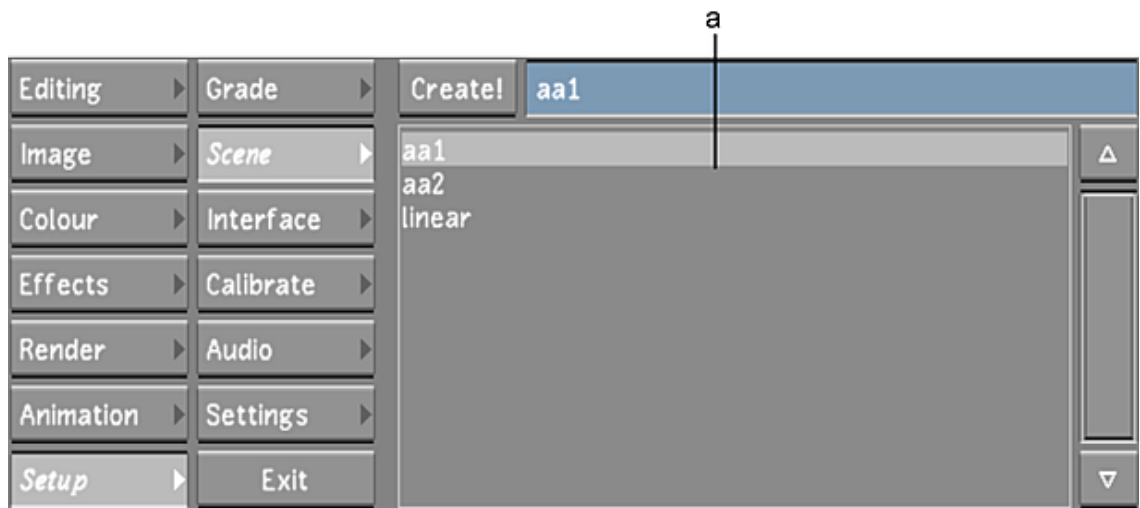
Each Scene folder contains the following folders:

- Audio
- Grade Bin
- Library: this contains all the metadata such as cuts and grades files.

For example, the grade metadata is stored in a file named *grdxx.grade*, where *xx* is the number of the grade file, and the cut metadata is in a file named *cutname.cut*, where *cutname* is the name of the cut.

To create a scene:

- 1 In the Main menu, click Setup, and then click Scene.
The Scene menu appears.



(a) Scene list

- 2 Enter a name for the new scene in the Create Scene field. If there is already a name in the Create Scene field, delete it and then enter the new name. This does not affect the existing scene.

NOTE You can create a scene with the name of an existing sub-directory of the Project Home; in this case, Lustre recognizes the directory as a scene and places the required scene metadata directory inside it.

- 3 Click Create.

The new scene is added to the Scene list. It is highlighted in grey, indicating it is the currently selected scene.

Selecting Scenes

Grade menu, selecting a sceneScene menu, selecting a scenescenes:selectWhen you select a scene, you gain access to the metadata associated with the scene such as cuts, grade files, the scene-based presets and grade bin, EDLs and audio. Once you select a scene, you then select the grade you want to work on from a list of those associated with the scene. The grade and its associated cut will then be loaded.

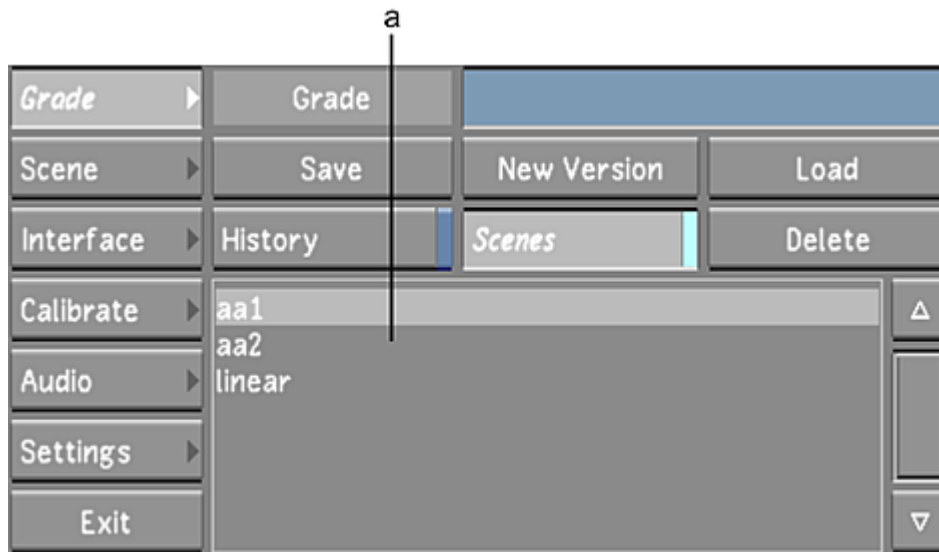
You can select a scene from either the Scene or Grade menu.

To select a scene from the Scene menu:

- 1 In the Main menu, click Setup, and then click Scene.
The Scene menu appears.
- 2 In the Scene list, click a scene to select it.
It is highlighted in grey, indicating it is the selected scene.

To select a scene in the Grade menu:

- 1 In the Main menu, click Setup, and then click Grade.
The Grade menu appears.

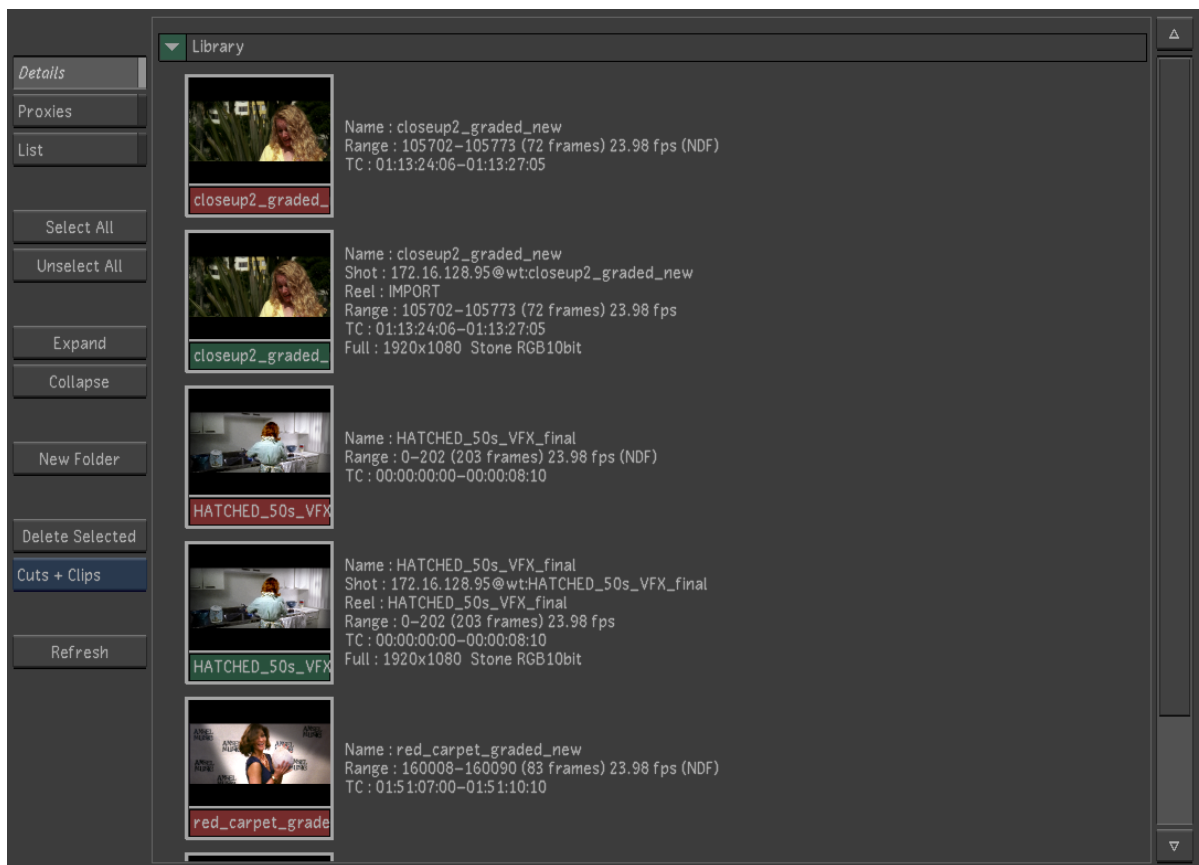


(a) Scene list

- 2 Enable Scenes.
A list of scenes created in the current project appears.
- 3 In the Scene list, click the scene to select it.
It is highlighted in grey, indicating it is the selected scene.

Working with Cuts and Grades

When you create a project, a default scene is automatically created. Within each scene is a Library which contains your source clips (.clip) and timelines or cuts (.cut). A cut is automatically created when importing a Wiretap timeline or assembling an EDL. With source clips imported from the Library, you must create the cut manually.



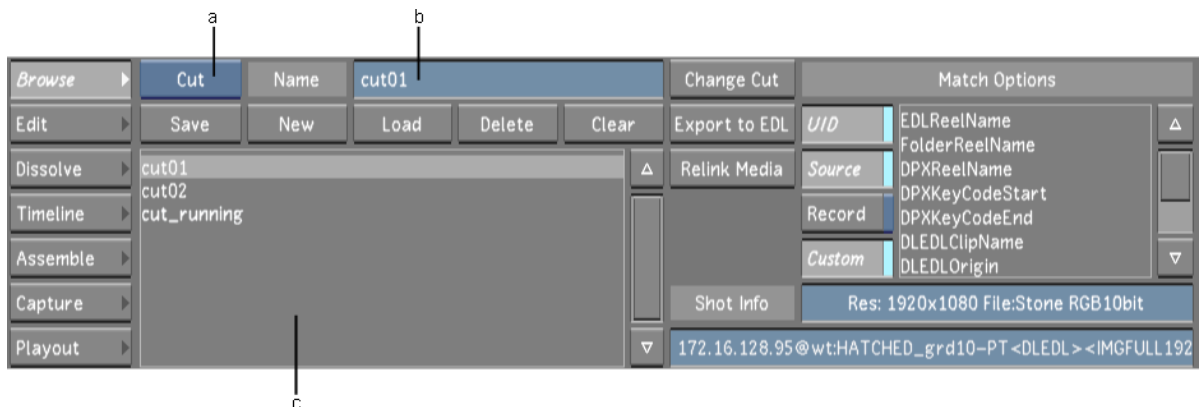
Footage courtesy of EVN PRODUCTIONS

Source clips have green labels; Timelines (or cuts) have red labels.

NOTE Grades are not displayed in the Library because they are managed separately.

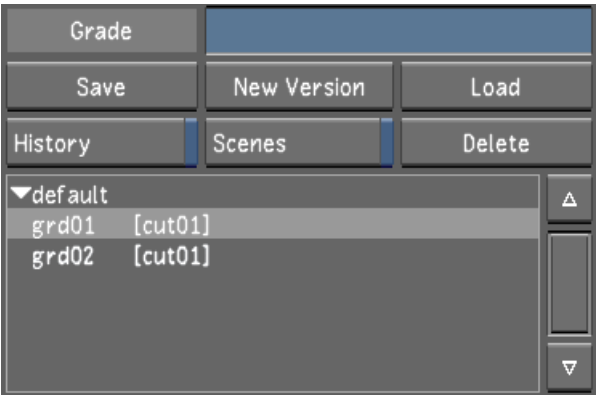
The Browse menu gives you access to all the tools you need to create and manage cuts and change lists. A cut contains edited shots in a timeline, as well as any modifications to the shots such as transcoding, transition effects or Timeline FX metadata from Wiretap.

A change list applies to a specific cut and contains information about how the contents of a cut has changed. When you apply a change list to its parent cut, the cut is modified to match the change list. Change lists are described in [Using Change Lists](#) (page 103)



As soon as you have created or imported a cut, you need to create an associated grade to contain all the grading information.

A grade is always linked to the cut, but the metadata contained in the grade file is independent of the cut . You can, for example, edit the cut, reorder the shots or add cross-fades, and the grade will not be affected. The grade data for a particular shot will still be linked to it after editing.



When you save the grade, any modifications made to each shot in the associated cut are saved to a grade metadata file. This file is named *grdxx.grade*, where *xx* is the number of the grade file. In addition, any changes made in the Dust menu are saved to a dust metadata file and changes made to the cut (such as trims or dissolves) are saved to the cut metadata file when the grade is saved.

Usually, you save the grade for an entire cut. In some circumstances, it can also be useful to save the grade of an individual shot. See [Saving and Loading Marry Grades](#) (page 113)

Cardinal rules:

- You can have multiple versions of cuts, but each cut should have an associated grade.
- You can create multiple grade versions that reference the same cut.
- A cut can exist without a grade, but **a grade cannot exist without a cut**, therefore we do not recommend ever deleting a cut still referenced by a grade. This results in the grade still being displayed in the list, without you being able to use it.
- You cannot move a cut to a different folder in the Library once a grade is associated with it, as this will break the link between the cut and the grade.

Managing Cuts

cuts:managingUse the tools in the Browse menu to manage your cuts. You can load, save, change, and delete cuts from this menu.



The New button is used for creating new cuts from scratch, or creating a new timeline based from an existing cut. When you create a new cut or cut version, you always need to provide a new name for the cut in the Cut name field.

The Save button is used to overwrite an existing cut.

Creating a New Cut

creating:cuts:creating new

When you create a new scene, you have an empty timeline. Unless you are assembling from an EDL or importing a Wiretap timeline, you must manually create a new cut.

The Save button is for saving editorial changes to a currently loaded cut.

If you want to create a new cut, you will need to click New.

To create a new cut:

- 1 Click Editing, and then click Browse to display the Browse menu.
- 2 Drag source clips from the Browser or Library and drop into the Storyboard or Timeline.
- 3 Enter the name for the new cut in the Cut Name field.
- 4 Click New.

A new cut is created. The name given to the cut appears in the Cut Name list.

To create a new cut version or to save a cut with a new name:

- 1 Click Editing, and then click Browse to display the Browse menu.
- 2 Display the Cut Name list by selecting Cut from the Cut/Change List.
- 3 Select an existing cut from the Cut Name list and click Load.
- 4 Enter the name for the new cut in the Cut Name field.
- 5 Click New.

A new cut is created from the current timeline. The new name given to the cut appears in the Cut Name list.

NOTE It is important to create an associated grade version for the cut, see [Creating a Grade Version for a Cut](#) (page 105).

Saving a Cut

The most recent changes to a cut are not saved automatically. You explicitly save your cut in the Browse menu, although you can set up a regular autosave interval.

To save a cut:

- 1 Click Editing, and then click Browse to display the Browse menu.
- 2 Click Save.

The cut is saved.

Loading a Cut

You can load an existing cut to resume editorial work on a previously saved timeline.

To load a Cut:

- 1 Click Editing, and then click Browse to display the Browse menu.

- 2 Display the Cut Name list by selecting Cut from the Cut/Change List option box.
- 3 Select the cut in the Cut Name list, and then click Load.

The selected cut is loaded into the timeline.

NOTE You can also load a cut by dragging a Timeline from the Library and dropping into the Storyboard or the timeline.

Clearing a Cut

You can clear the current cut when you no longer need it.

To clear a cut:

- 1 Click Editing, and then click Browse to display the Browse menu.
- 2 Click Clear.
- 3 Click Confirm.

The cut is cleared from the storyboard and the timeline.

Deleting a Cut

deleting:cuts:deletingYou can delete a cut when you no longer need it.

IMPORTANT Do not delete a cut if it has an associated grade file. The grade is dependent upon its cut.

To delete a cut:

- 1 Click Editing, and then click Browse to display the Browse menu.
- 2 Display the Cut Name list by selecting Cut from the Cut/Change List option box.
- 3 In the Cut Name list, select the cut you want to delete.
- 4 Click Delete.
- 5 Click Confirm.

The cut is deleted.

NOTE You can also delete a cut from the Library by selecting the cut thumbnail and clicking 'Delete'.

Using Change Lists

cuts:tracking changeschange lists:using to track changesA change list tracks editorial changes to the shots and layers that make up a cut. You use a change list when you want to save changes to a cut without overwriting the cut file. Using this process you can review changes in a cut prior to saving the cut file itself.

The change list tracks the following types of changes:

- Addition/Removal of shots to the cut
- Addition/Removal of layers to the cut
- Rearrangement of shots
- Replacement of shots

A change list always maintains a relationship with the cut from which it is created (the parent cut). You can apply a change list only to its parent cut.

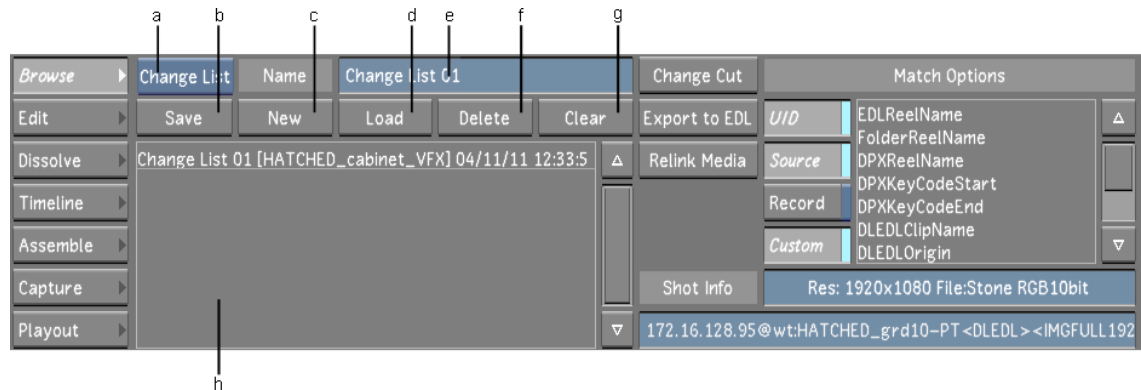
Creating a Change List

change lists:creatingcreating:change listsAfter making modifications to the shots in a cut, you can create a change list to save the changes.

To create a change list:

- 1 After modifying the shots in your cut, click Editing, and then click Browse to display the Browse menu.
- 2 Select Change List from the Cut/Change List option box.

The Change List controls appear.



(a) Cut/Change List option box (b) Save button (c) New button (d) Load button (e) Change List Name field (f) Delete button (g) Clear button (h) Change List Name list

- 3 Type a name for the change list in the Change List Name field.
- 4 Click New.

A change list is created. You can see the name of the parent cut in parentheses next to the change list name.

Loading a Change List

change lists:loadingloading:change listsYou apply the changes stored in a change list to the cut from which the change list was created. This cut is the parent cut.

After you have loaded a change list to its cut, you can continue making changes and save them as a second change list. This second change list contains the changes in the first change list, so should you need to reload all the changes to the parent cut, you do not need to reload the first change list.

To load a change list:

- 1 Load the parent cut to which you want to apply the changes.
- 2 Select Change List from the Cut/Change List option box.
- 3 Select the change list in the Change List Name list.
- 4 Click Load.

The changes stored in the change list are applied to the parent cut.

Deleting a Change List

change lists:deletingdeleting:change listsYou can delete a change list when you no longer need it.

To delete a change list:

- 1 Click Editing, and then click Browse to display the Browse menu.
- 2 Display the Change List Name list by selecting Change List from the Cut/Change List option box.
- 3 In the Change List Name list, select the change list you want to delete.
- 4 Click Delete.

The change list is deleted.

Managing Grades

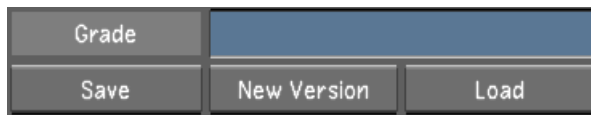
Though grades are managed separately from their associated cuts, a grade is dependent upon a cut. You cannot create a grade file without an associated cut.

NOTE Using the Change Cut feature, you can apply a grade to a different cut that contains some or all of the same shots. The grade will be applied to the common shots in the new cut.

See [Changing a Cut](#) (page 107).

Creating a Grade Version for a Cut

Save the grade to store the grading data on a specific cut. Grades are named using sequential numbers, but you can optionally add a text name to the number.



NOTE You cannot create a grade if a cut is not loaded since a grade needs to always be linked to a cut.

To create a grade for a cut:

- 1 Create or load a cut for which you want to save a grade. See [Managing Cuts](#) (page 101).
- 2 Work on the grade as needed.
- 3 In the Main menu, click Setup, and then click Grade.
The Grade menu appears.
- 4 In the Grade menu, do one of the following:
 - Click New Version to save the new grade version as a binary file.
 - Hold down **Ctrl** and click New Version to save the grade version as an XML file.
- 5 (Optional) Type a name for the grade in the Grade field and press Enter.

The grade appears in the Grade list under the current scene. It is given a sequential number. If you gave it a name, that name appears in addition to the number. The name of the associated cut appears in brackets to the right of the grade name.

Saving a Grade

When you save a grade by clicking the Save button under the Grade name field in the Setup/Grade menu, the changes are saved by overwriting the currently loaded grade.

IMPORTANT If you have a cut loaded without an associated grade, clicking Save will create grade called "default". If you want to create an actual grade version number, ie. grd01, you need to click New Version.

To Save Changes to an Existing Grade:

- 1 In the Main menu, click Setup, and then click Grade. The Grade menu appears.
- 2 Make sure the grade you want to save is loaded.
- 3 Do one of the following:
 - Click Save to save the grade as a binary file.
 - Hold down Ctrl and click Save to save the grade as an XML file.

The current settings are saved to the existing grade version.

Loading Grades for a Cut

When you start a work session in Lustre, switch scenes in a project, or want to revert to an older version of a grade, you can select the required grade and load it. This loads both the grade and its associated cut.

WARNING You must save the currently loaded grade before switching to another grade, or you will lose any changes you have made to it.

To load a grade:

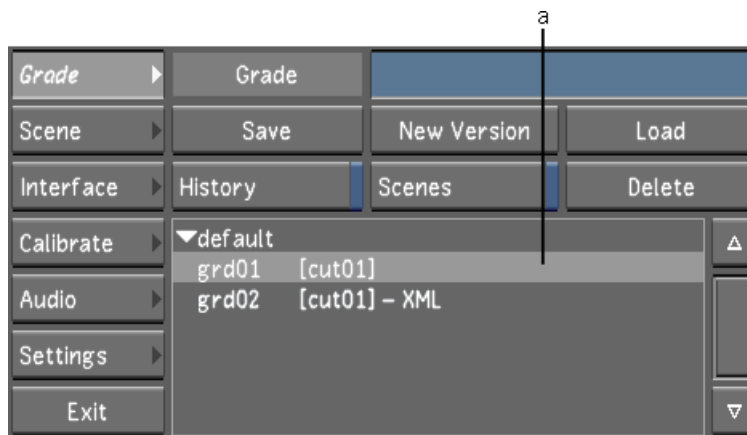
- 1 In the Main menu, click Setup, and then click Grade.
The Grade menu appears.
 - 2 Click the grade you want to load.
The grade is highlighted in the list.
 - 3 Do one of the following:
 - Click Load to load a grade file in binary format.
 - Hold down the `Ctrl` key and click Load to load a grade file in XML format (the XML suffix follows the grade name).
- The grade and associated cut are loaded.

Deleting Grades

deleting:gradesgrades:deletingYou can delete grades that you no longer need.

To delete a grade:

- 1 In the Main menu, click Setup, and then click Grade.
The Grade menu appears.



(a) Grade list

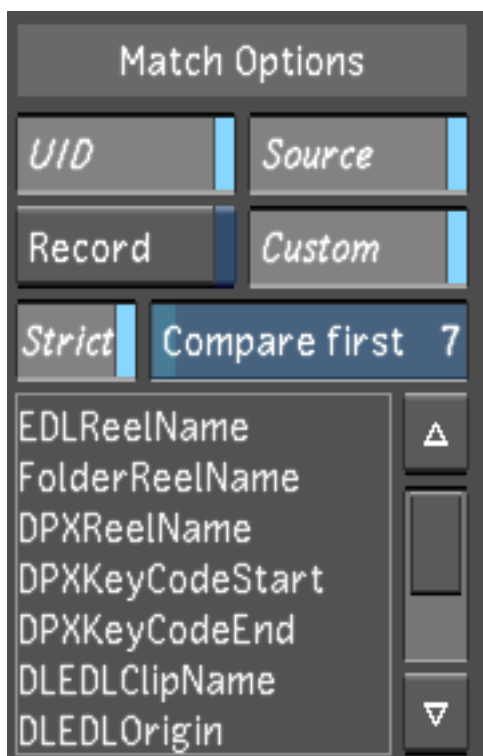
- 2 Display and select the grade you want to delete in the Grade list.
It is highlighted in light grey. You do not have to load it.
- 3 Click Confirm.

Changing a Cut

grades:maintaining when swapping cutscuts:changing without affecting grade settingscuts:match optionsThe Change Cut tool allows you to apply the grade settings from the current cut to the new cut you are loading. Flags, notes and Group settings are carried over when you perform a Change Cut.

For example, assume you create a grade with a cut file. You then receive a new EDL and create a new cut from it. This new cut is similar to the first one because it uses many of the same shots, so you would like to use the grade settings that are already done to prevent manually reloading individual grade settings. You load the grade with the original cut, and then change to the new assembled cut. The grade settings that were in the original cut are transferred to the shots that correspond to the Match Options (described below). The Match Options are available in the System & Menu tab of the User Settings.

The grade is applied to the new cut based on the Match Options (i.e., UID, Source, Record, and Custom). You can base the match on one or multiple options.



NOTE Though the Custom option is enabled by default, nothing is initially selected from the Custom list.

Select:	To:
UID	Match the unique ID of the shots in the original cut to the new cut.
Source	Match the tape/reel name, source ID, and source timecode of the original cut to the new cut.
Record	Match the record timecode of the original cut to the new cut.
Custom	Match the original cut to the new cut based on the keyword that is selected in the custom list. or based on the specified number of first characters in the file names.
Strict	Toggle between Strict and Partial matching. When Strict is enabled, the criteria have to match exactly. When disabled, the matching is partial and you can define the number of characters to be compared for a Match to occur.

If the Custom option is enabled, there is a list of keywords to which you can associate the custom option.

Select:	To:
EDLReelName	Match the reel name of the EDL.
FolderReelName	Match the folder reel name.
DPXReelName	Match the DPX reel name.

Select:	To:
DPXKeyCodeStart	Match the DPX header keycode start.
DPXKeyCodeEnd	Match the DPX header keycode end.
DLEDLClipName	Match the clip name of the shot coming from the Wiretap server.
DLEDLOrigin	Match the image import path and file name of the timeline coming from the Wiretap server.
DLEDLSourceId	Match the media source's unique ID of the timeline coming from the Wiretap server.
DLEDLSegmentId	Match the segment's unique ID of the timeline coming from the Wiretap server.
DLEDLStartTc	Match the start source timecode of the timeline coming from the Wiretap server.
EDLComment	Match the unique comment that is applied to the original cut from another application.

The more match options that are enabled, the easier it is to complete an accurate change cut. For example, if you enable UID, Source, and Custom, the same shot can be in the timeline numerous times and the grade will be matched according to the shot's unique ID, tape/reel name, source ID, source timecode, and the custom option you have selected.

Lustre can also apply grading to a new cut on a shot-to-shot (and layer-to-layer) basis, regardless of any matching criteria. This is similar to a direct transfer of grading, depending upon the location of the shots within the timeline. To apply this type of change cut, disable all of the Match Option buttons.

For example, if the original cut is a single layer with two shots, the grade is applied to the new cut's first two shots (if there are more than two shots), even though there is no matching criteria between the shots in the original and new cut.

On a multi-layered cut, if there are two layers of shots in the original cut, the grade is applied to the first two layers of the new cut, on a shot-to-shot basis, even if the new cut has more than two layers. Note that within a multi-layered timeline, the grading is applied to the bottom layer first.

NOTE An alternative to the procedure below is the Match Grade feature. It allows you to apply current grade settings to a new assembled timeline without having to first create a cut file and then apply the Change Cut option. See [Match Grade](#) (page 243).

To apply a grade with Change Cut:

- 1 Make sure a graded cut is already loaded into the timeline.
- 2 Click Editing, and then click Browse to display the Browse menu.
- 3 Display the Cut Name list by selecting Cut from the Cut/Change List option box.
- 4 Select the cut you want to change the grading to in the Cut Name list.
- 5 Enable the match options you want applied to the change cut.
- 6 Click Change Cut.

The new cut is loaded with the grade settings from the old cut. The storyboard, if displayed, reflects the changes in the following manner:

- Thumbnails of shots to which grading decisions were applied from a Change Cut are updated with the new grade.

- Thumbnails of shots to which grading decisions were applied from a Change Cut, based on partial matching are updated with the new grade and display the Partial Match Flag (orange triangle flag).
- Thumbnails of shots to which grading decisions were not applied from a Change Cut are shown with the Failed Match (red triangle flag). This is due to non-matching criteria or to new shots having been added to the sequence that require grading.

When working with a multi-layer timeline, and Solo mode is disabled, the layers are flattened and only the grade settings from the shots that are visible in the Storyboard are applied to the new cut. When working with a multi-layer timeline and Solo mode is enabled, only the grade settings from the active layer are applied to the new cut. If the new cut has multiple layers, then the grade setting is applied to each layer.

- 7 Click Setup, and then click Grade to display the Grade menu.
- 8 Click New Version to save the grade with the newly associated cut.

Partial Matching for Change Cut

When performing a Change Cut, Lustre uses the various Match options to transfer grading decisions from one cut to another. By default, Strict Matching is enabled and the criteria have to match exactly. In some visual effects workflows however, it happens that file names differ between editorial versions even though they're comprised of the same shots. For these cases, you can perform partial matching using the Custom Match option and disabling Strict matching. For example:

- The original sequence name is seq1_shot1_version1, while the updated sequence name is seq1_shot1_version2.
- The Change Cut is performed based on a Custom / DLEDL Clip name.

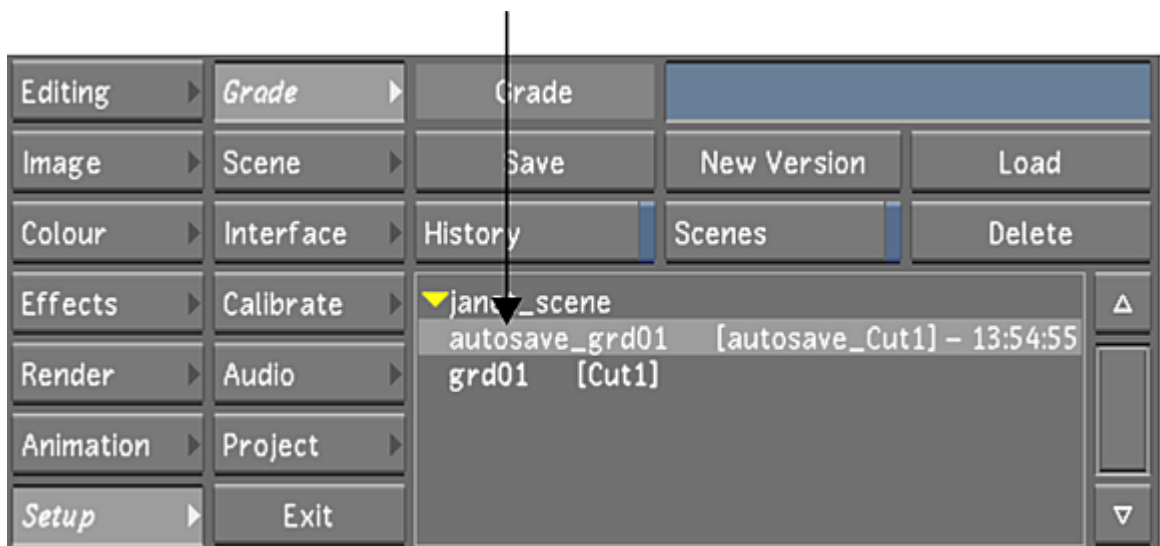
The Match is based on partial criteria, and the Partial Match Flag is displayed in the Storyboard.

In this context, you can also specify the number of characters to be compared for a Match to occur, using the slider to the right of the Strict button.

Autosave Grades and Cuts

The Autosave feature ensures that the current grade and cut from the scene you are working on are backed up at specified time intervals. Only one grade and one cut per scene can be backed up. To enable the Autosave feature, enter an interval in the Autosave field of the System & Menu tab. See [System & Menu Settings](#) (page 88).

When you are using Autosave, a snapshot of the current grade and cut appears in the Grade list. The word '*autosave_*' is added to the beginning of the grade and cut name and a time stamp of the autosave is added to the end.



NOTE The autosave information in the Grade list is not updated according to the Autosave time interval, therefore, you need to press **Ctrl+R** to refresh the information.

A snapshot of the grade, cut, and all their associated files is captured in the Library folder.

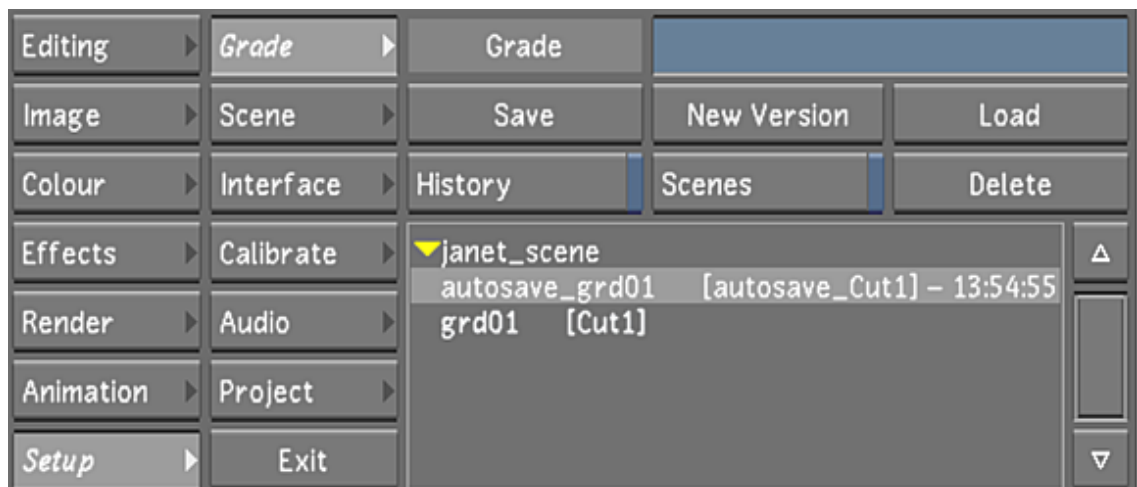
There are certain scenarios where an Autosave is performed before its scheduled time interval. These scenarios include the following:

- After you generate proxies
- When you create a new grade (after performing a change cut or restoring an autosaved grade or cut)

Autosave is suspended if you perform a change cut. See [Applying a Grade to a Cut](#) (page 107). If a change cut is performed, you need to load a grade, save a grade, or create a new grade for the Autosave to reactivate.

To restore an autosaved grade and cut:

- 1 In the Main menu, click **Setup**, and then **Grade**.



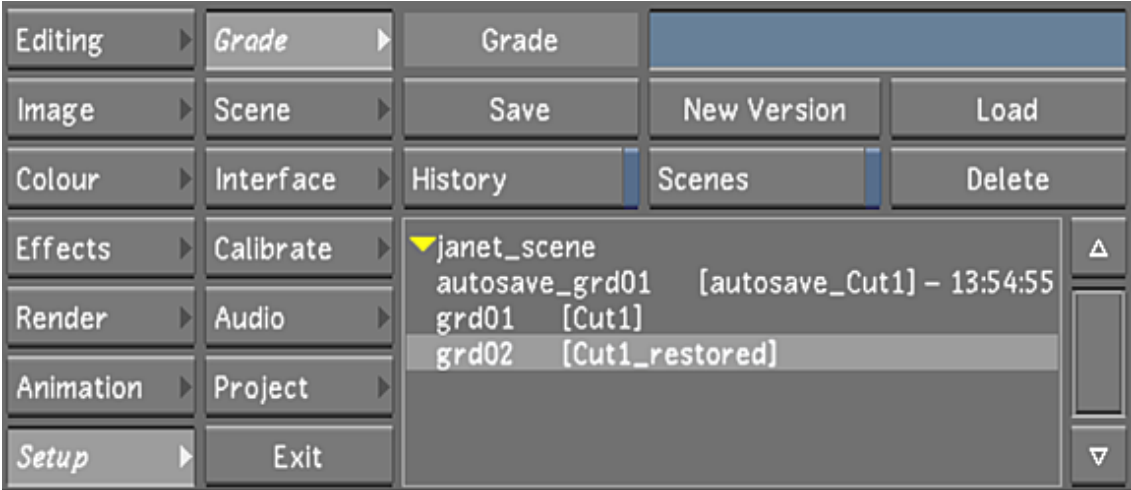
- 2 Press **Ctrl+R** to make sure the most current autosave information is displayed in the Grade list.
- 3 Select the autosaved grade and cut.
- 4 Click **Load**.

NOTE The autosaved version of the cut file appears in the cut name list (e.g., *autosave_Cut1*).

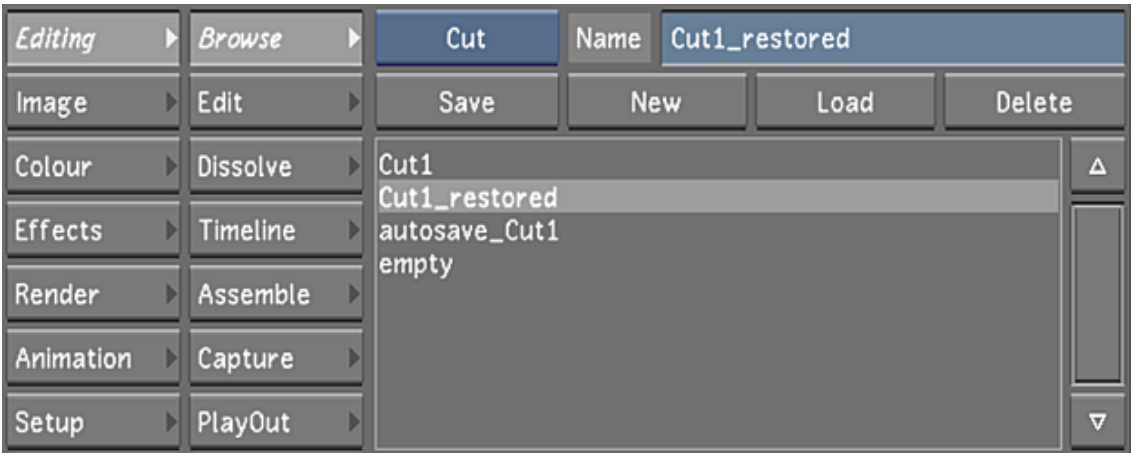
5 Click New Version.

NOTE You cannot click Save because you cannot overwrite a loaded Autosave cut and grade.

A new grade is saved and associated with the restored cut.



For the cut file, the existing cut file name is used and *_restored* is added to the end of the name to differentiate the original cut from the one that is restored by using Autosave.



NOTE If you are working with Autosave and multiple grades, you need to use the Grade History list for a list of all the backup grades.

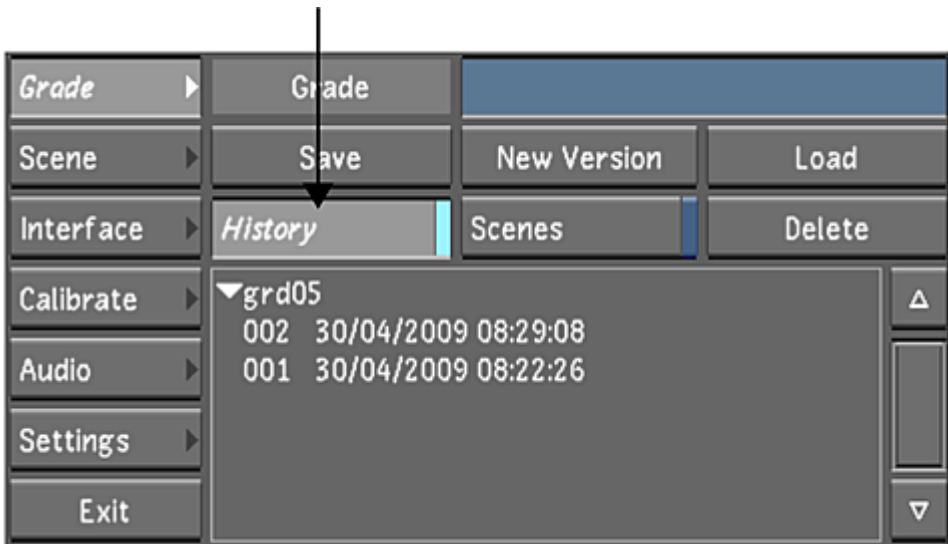
Loading Backup Copies of a Grade

History list, loading for a gradegrades:loading backup copiesAs you save a grade, you can have Lustre save a copy of it each time you click Save. These copies are then available in case you need to revert to a previous version. The date and time of the save is provided to help you identify the version you want to load.

NOTE To save backup copies of grades, you need to first enable the History button when configuring the user. See [System & Menu Settings](#) (page 88).

To revert to a backup copy of a grade:

- 1 Make sure the grade for which you want a backup copy is loaded. See [Loading Grades for a Cut](#) (page 106).
- 2 In the Grade menu, click History.

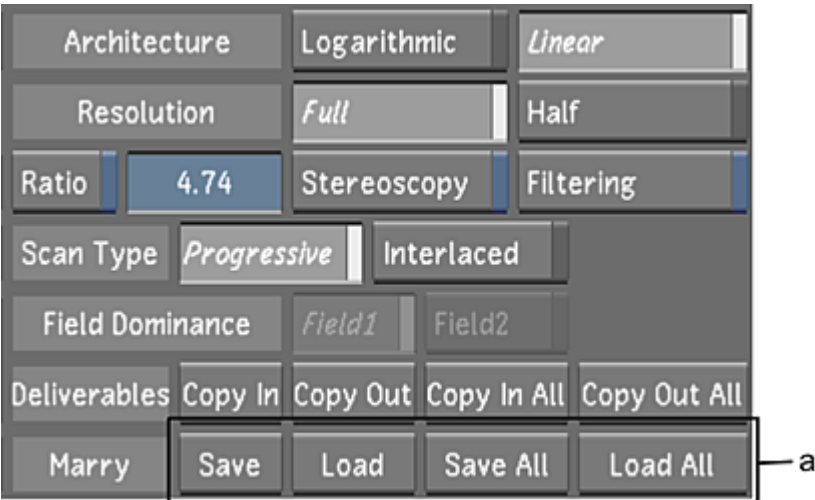


The Grade History list appears. This is a list of backup copies of the currently loaded grade.

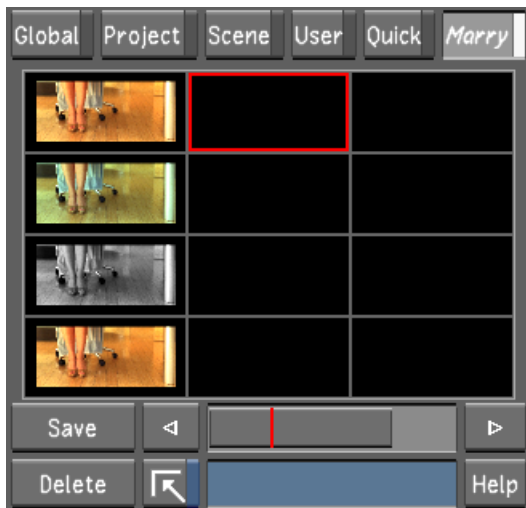
- 3 Click the backup version you want to load.
The backup grade is loaded.

Saving and Loading Marry Grades

Marry grades:saving and loading using Marry controlsgrades:saving and loading using Marry controlsWhen you save a grade using the Marry controls, the colour grading metadata is saved separately from the regular grade file. Marry grade files are saved in the same location as the original shots (except for shots imported from Wiretap or the Wiretap Gateway). Marry grade files can also be saved and loaded with the Marry Grade bin thumbnails and Grade view. See [Using the Marry Grade Bin](#) (page 151).



(a) Marry controls



Marry Grade bin

You can save an individual grade for the current shot or grades for all the shots in the timeline. Similarly, you can load the grade back to the current shot or to all shots in the timeline. One situation where Marry grade files can be useful is if you start your project working on a rough cut of a scene, and later are given the final EDL for the scene. You can save the grades created for particular shots on the rough cut and apply them to shots on the final cut.

Marry grade files can be created with any type of content and are saved along with the original scans files. Marry grades created from Wiretap or Wiretap Gateway media are stored under a local *wt* folder under the Scans Full Home or Scans Half Home.

Marry grade files are saved as binary files by default. You can also save the grading metadata as an XML file.

NOTE You can load Marry grade files from previous versions of Lustre that are in text format. They will be automatically converted into binary files.

The folders in which Marry grade files are saved are named based on the unique identifier (UID) or wedge number of the shot. When you use the Scene Detect function to splice a larger shot into individual shots, each scene-detected shot is also assigned a unique identifier (UID). A shot is also assigned a wedge number, which is a range based on the first and last frame in the shot. A wedge number is also associated to shots that are spliced manually.

NOTE You can find the UID for each shot in the cut file located in your scene's Library folder.

When configuring the Marry Grade panel, select Based on Wedge or Based on UID in the Marry Grade File Location option box. See [Rendering Settings](#) (page 68).

To save the grade of one or all shots in a cut:

- 1 Click Setup, then click Grade to display the Grade menu.
- 2 If you are saving the grade for one shot, navigate to that shot. See [Navigating through Shots](#) (page 322).
- 3 Using the Marry controls, do one of the following:
 - Click Save to save the grade for the current shot as a binary file.
 - Click Save All or hold Shift and click Save under the Marry Grade bin to save individual grades for each shot in the cut.
 - Hold down the `Ctrl` key and click either Save or Save All to save the grade(s) in XML format.

To load the grade of one or all shots in a cut:

NOTE To load grades using the Marry controls, the shots in the two cuts must point to the same original footage. If you want to apply the grade of one shot to a different shot, use the Grade bin. See [Using Grade Bins](#) (page 151).

- 1 Load any cut containing one or more shots for which individual grades have been saved.
- 2 If you are loading the grade of one shot, navigate to the shot.
- 3 Using the Marry controls, do one of the following:
 - Click Load or double-click the appropriate thumbnail in the Marry Grade bin to load the grade of the current shot.
 - Click Load All or hold Shift and double-click the appropriate thumbnail in the Marry Grade bin to load the grades for all shots in the cut.

The grades are loaded to the shots. If the cut contains shots for which no individual grades were saved, those shots are unchanged.

Setting Logarithmic or Linear Mode

colour space:setting for projectsprojects:setting colour space architectureUse the Colour Space Architecture options to select between the two basic colour grading modes — Logarithmic and Linear — for use on the project. These modes configure the system and set certain user interface options specific to the mode.

Generally speaking, a project should consist entirely of either Logarithmic or Linear files. For example, film-based projects are usually graded in Logarithmic mode, while video-based projects are usually graded in Linear mode. You should set the architecture to the mode you are planning to work in. If some source files are different from the mode you want to work in, you can convert them before using them. For example, if you are working in Linear mode, and you have a few Logarithmic files, you can convert them to Linear after bringing them into Lustre. To convert a shot from Logarithmic to Linear and vice versa, use the Input LUT menu. See [About LUTs](#) (page 381).

The colour space architecture can be set differently per grade, which may be useful in some circumstances, but typically you should set the architecture for the entire project before beginning. Once you start working on your shots, you should not change the architecture as this affects the images and may create unwanted results.

NOTE The colour space setting for rendering also affects images. See [Setting Colour Space Options](#) (page 602).

Colour Grading Toolset Differences

colour space:UI differences between Logarithmic and Linear modeuser interface:differences in Logarithmic and Linear modeThe colour grading toolset varies depending on if you are in Linear or Logarithmic mode:

- When the colour space is set to Linear, the controls in the Grading menu are customized to reflect the workflow typically used on a video-based project. When set to Logarithmic, the controls reflect the workflow of a film-based project. See [Primary Colour Grading](#) (page 415).
- Printer lights only appear in Logarithmic mode. See [Adjusting Printer Lights for Primary Grading](#) (page 418).
- In the Input LUT menu, the controls for creating a Logarithmic to Linear conversion LUT are only available in Linear mode. See [Linear Mode: Creating Conversion LUTs](#) (page 385).

To set or modify the colour space architecture for the project:

- 1 In the Grade menu, enable Logarithmic or Linear.

See [Project Configuration Settings](#) (page 63)

Saving Timeline RGB Offsets

You can save the grade for the entire timeline in a file called *primary.txt*. This file is similar to the *.dsc* file, except that the information is timeline-based as opposed to folder-based and cannot be loaded back into Lustre. The benefit of saving timeline RGB offsets is that you can exchange primary grading data with other systems.

The following is an example of what the *primary.txt* file looks like:

GRAO 2

46928774000050 <HOME>/2k/dpx/2048x1556/008_%05d.dpx -64.457 80.586 -16.129

46928774000052 <HOME>/2k/dpx/2048x1556/009_%05d.dpx*-52.922 84.429 -31.507

To save the grade for the timeline:

- 1 Press Shift+G.

The *primary.txt* file is generated in the Lustre export directory, e.g. *C:\Program Files\Autodesk\Lustre<version>\export* on Windows, and */usr/autodesk/lustre<version>/export* on Linux.

The Shift+G hotkey has another function. In addition to saving the primary grading data for the timeline, the hotkey automatically runs batch scripts. This could be used, for example, by a facility to convert the grading data to a LUT or third-party Color Decision List (CDL).

To automatically run a batch script:

- 1 Create a batch script called *primexport.bat*.
- 2 Place *primexport.bat* in the *C:\Program Files\Autodesk\Lustre<version>\export* directory on Windows, and */usr/autodesk/lustre<version>/export* on Linux.
- 3 Press Shift+G.

Lustre saves the primary offset RGB values for the timeline in the *primary.txt* file, and automatically runs the batch script.

Setting the Resolution

resolution:projectprojects:setting the resolutionYou can work on the full-resolution version of shots or proxies. Using proxies speeds up interaction and playback of shots containing many effects.

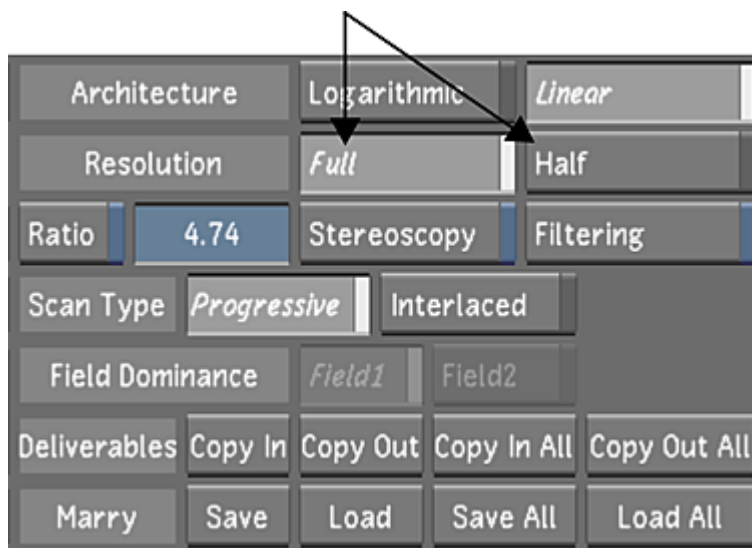
You can switch between full and half resolution at any time. Generating and displaying proxies does not affect your original footage in any way. The resolution is independent of the grade metadata and is therefore completely non-destructive to your work. Metadata is applied to footage only when you render it. You specify the resolution you want for the render files at the time you render.

To display proxies, you must first generate them within Lustre or create them outside Lustre and place them in the project directory structure. If you opt to work on proxies, it is recommended that you generate them as soon as the cut is created so that they will be immediately available for use. See [Generating and Viewing Proxies](#) (page 603) and [Recommended Directory Structure for Projects](#) (page 59).

To set the resolution:

- 1 In the Grade menu, enable Full or Half resolution.

TIP You can also use the F9 hotkey or the 1 / 1/2 button in the View mode panel.

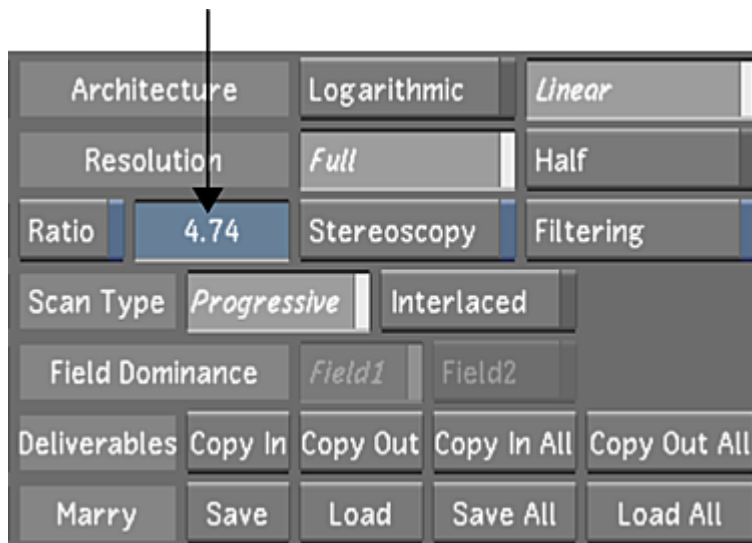


Setting the Aspect Ratio

You can set the display aspect ratio for shots in the project. When you change the aspect ratio, the shots are stretched accordingly.

To set the project aspect ratio:

- 1 In the Grade menu, enable Ratio.
- 2 Enter the aspect ratio in the Ratio field.



The shots are stretched to fit in the specified aspect ratio.

Setting the Filtering

The Filtering option allows you to soften your shot so when you zoom in, the pixels are not as sharp or obvious.

If the Filtering option is enabled during playout with GPU acceleration, the filtered image will be played out to tape.

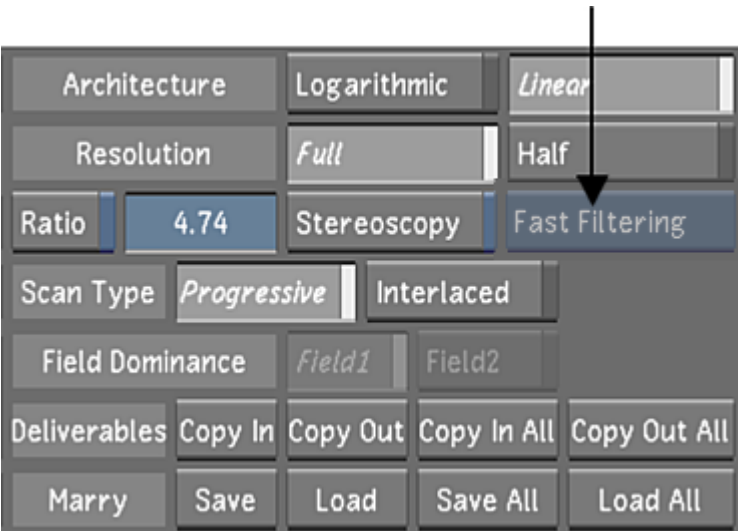
NOTE The Filtering option should be disabled when you want to isolate the colour of a pixel so it can be used with the HLS and Diamond Keyers.

To enable the filtering option, access the Grade menu and select your filtering option from the Filtering box.

Options are:

- No Filtering: The viewer is not filtered (same as Filtering Off in previous releases).
- Fast Filtering: The viewer is filtered and uses the same filtering as in previous releases.
- Quality Filtering: The viewer is filtered with new filtering algorithm that does not show moire on content with noise.

NOTE Filtering is only for viewing and does not affect grade rendering, but does affect SDI Preview. The state of this option is saved with the user profile.

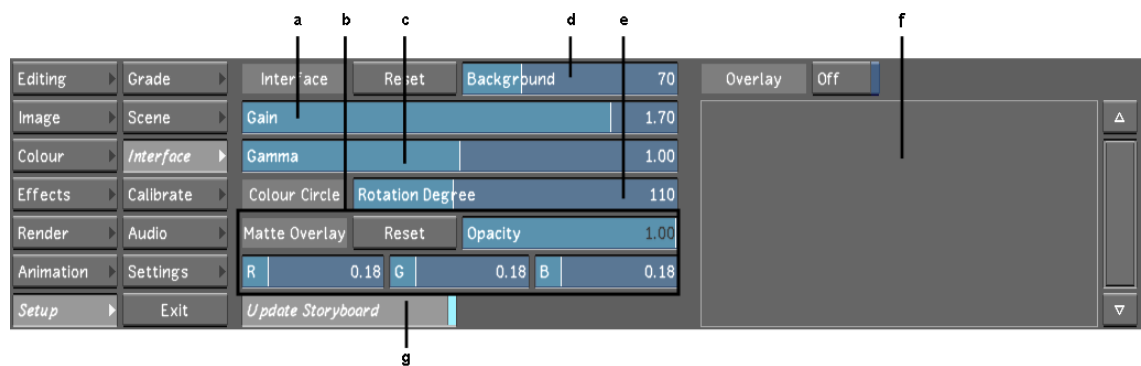


Setting Up the User Interface

Interface menu, customizing Lustres appearanceuser interface:setting appearance ofUse the controls in the Interface menu to set the appearance of the user interface to your liking. For example, you can set the user interface to suit the room lighting conditions as well as control the display of a matte overlay by adjusting the opacity and RGB parameters of the unselected region of the matte. From the Interface menu, you can also add an overlay, such as a logo, to your cut.

To access the Interface menu:

- 1 In the Main menu, click Setup, and then click Interface.
The Interface menu appears.



(a) Gain slider (b) Matte Overlay (c) Gamma slider (d) Background slider (e) Colour Circle slider (f) Overlays field (g) Update Storyboard button

The Interface menu is made up of the following elements.

Background field Sets the shade of grey of the area surrounding the player window.

Gamma field Sets the brightness of the midtones of the menu area. The gamma primarily affects the grey areas of the menu, such as button backgrounds.

Gain field Sets the overall brightness of the menu area. The gain primarily affects lighter areas of the menu, such as text.

Colour Circle field Sets the position of colours in the colour wheels found in the Grading menu. The default rotation degree is 110.

Reset button Resets all parameters in this menu to the default values.

Overlay list Includes a list of all files that can be applied as an overlay. See [Applying Overlays](#) (page 120).

Update Storyboard button Enables and disables the option to automatically update the storyboard thumbnails as you make changes to the shots within your timeline. See [Updating the Storyboard Thumbnails](#) (page 327).

Matte Overlay Settings

matte overlay settings When you perform secondary colour grading, whether with a geometry, a key, or an external matte, it is important to see what part of the image is being affected by the matte. The Matte Overlay feature displays the matte in its original colour, while overlaying the unselected region of the matte with a uniform colour, allowing you to see the precise area of your image that will be colour corrected.



Opacity Sets the opacity of the unselected region of the matte between fully transparent (0) and fully opaque (1).

RGB Set the intensity of the red, blue, and green colours for the unselected region of the matte.

Reset button Resets the Matte Overlay parameters to default values.

You can modify the Matte Overlay settings at any time when you are performing secondary colour grading without affecting the image output. See [Adjusting the Colour and Opacity of a Matte Overlay](#) (page 467).

NOTE Matte Overlay settings are saved per user; therefore, any changes are saved to the current user profile.

Applying Overlays

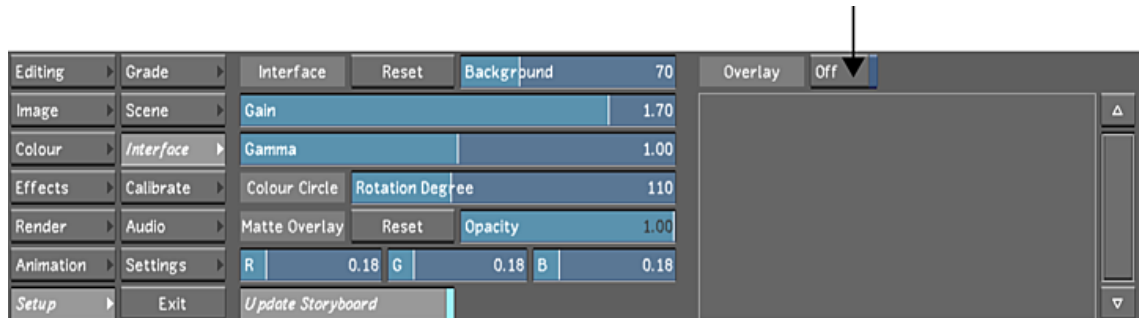
cuts:adding overlayoverlays, adding to cutsUse this feature to apply an overlay to your cut. For example, you can add a logo to every frame. An overlay consists of a single uncompressed RGBA, TIFF, or SGI® file containing alpha channel information. The white areas of the file are viewable in the cut.

To make files available for use as overlays:

- 1 Exit Lustre.
- 2 Navigate to the Lustre directory by doing one of the following:
 - If using the Windows version of Lustre, in Windows Explorer, go to *C:\Program Files\Autodesk\Lustre<version>*, where *C* is the drive where Lustre is installed.
 - If using the Linux version of Lustre, type:
cd /usr/autodesk/lustre<version>
- 3 Create a directory called *overlay*. To do this in Linux, type:
mkdir overlay
- 4 Place any files you want to use as overlays in this directory. To do this in Linux, type:
cp / <path>/<filename>/usr/autodesk/lustre<version>/overlay
- 5 Restart Lustre.

To apply an overlay to a cut:

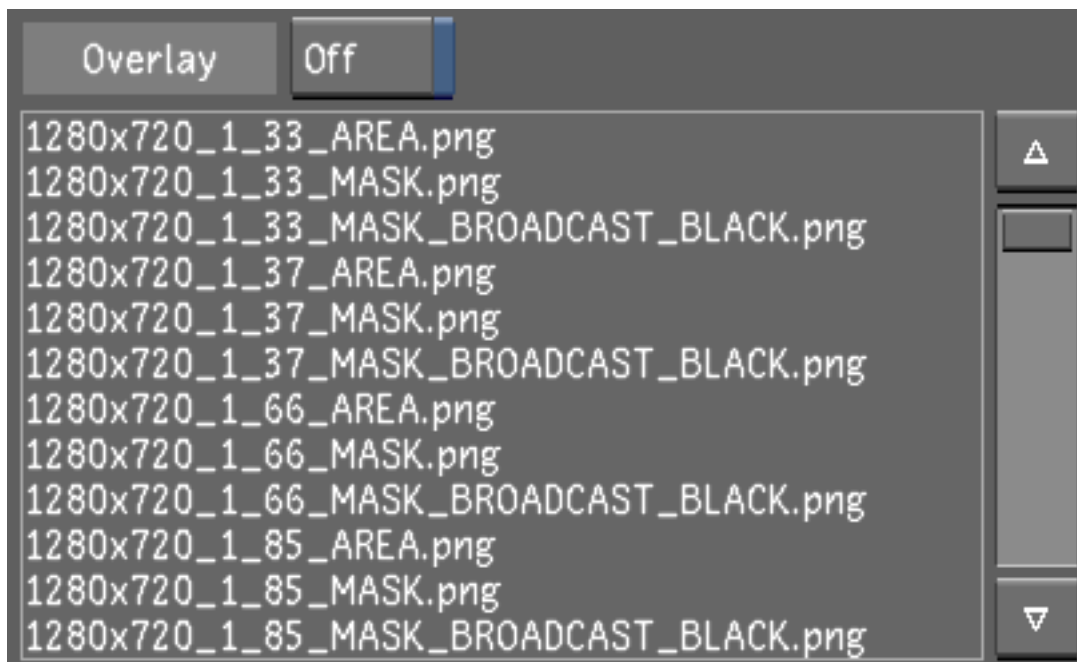
- 1 Load the cut to which you want to apply an overlay. See [Managing Cuts](#) (page 101).
- 2 In the Main menu, click Setup, and then click Interface.
The files in the *overlay* directory appear in the Overlay list.
- 3 Click the overlay file that you want to apply.
It is highlighted.
- 4 Enable On/Off.



The overlay is applied to the cut.

Overlay Presets

In the Setup / Interface menu, you can select an overlay from a list of overlay presets to apply to your media. You can use these overlays for play out to VTR.



The following overlay presets are available:

- **Area:** White outline showing the framing of the selected resolution and aspect ratio.
- **Safe:** White outline showing the full image area, the safe action and the safe title.
- **Mask:** Black mask showing the framing of the selected resolution and aspect ratio.
- **Mask Broadcast:** Use this mask when you want to playout the full video signal of the grade to VTR, using the Full Range playout option.

Overlays are available for the following resolutions:

- NTSC (720x486)
- PAL (720x576)
- 1280x720
- 1920x1080
- 2048x1556

NOTE Overlays are not saved with the grade file. They are a user interface attribute that is saved with the session. Overlays cannot be rendered to files.

See [VTR Playout and Full Range Video Signal](#) (page 121).

VTR Playout and Full Range Video Signal

You can play out grades from Lustre to VTR, using the full video range (0 to 255 in 8-bit and 0 to 1024 in 10-bit). To do so, select the Full Range playout option. In this mode, the black and white levels are remapped to the full video range. Make sure the following settings are in place prior to output to VTR:

- In the Project Management / Engineering tab, set the Virtual Black Clip Color to RGB 16-16-16 (for 8-bit) or 64-64-64 (for 10-bit). This creates a legal black video signal for black media.
- If your timeline contains one or multiple gaps on video layer 1, make sure to replace these segments with virtual black. Alternatively, if your timeline contains so many gaps as to render the substitution

impractical, insert a video layer underneath the first video layer and insert a virtual black clip spanning the length of the timeline.

- To use letterbox on your playout, use one of the Broadcast Black overlays provided instead of using Image / Reposition or Render / Resize. These Broadcast Black overlays have a black video level that, when remapped, is set to legal black video level.

Working with Templates

Use templates to define re-usable presets for future projects or users.

Creating a Project Template

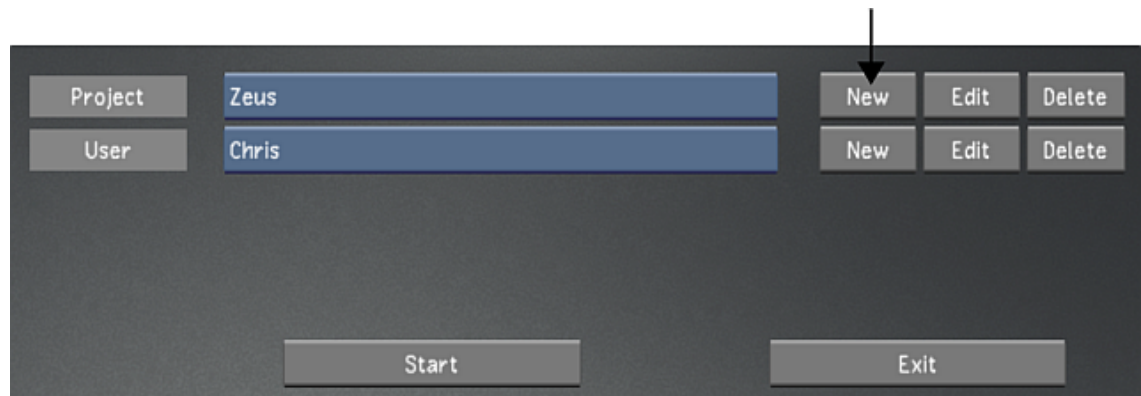
When you are choosing your project settings, you can create a template for your future projects.

From the Project Template group, within the Project settings page, you can complete the following:

- Create a new project template.
- Create a new project template from an existing project.
- Create a new project template from an existing project template.

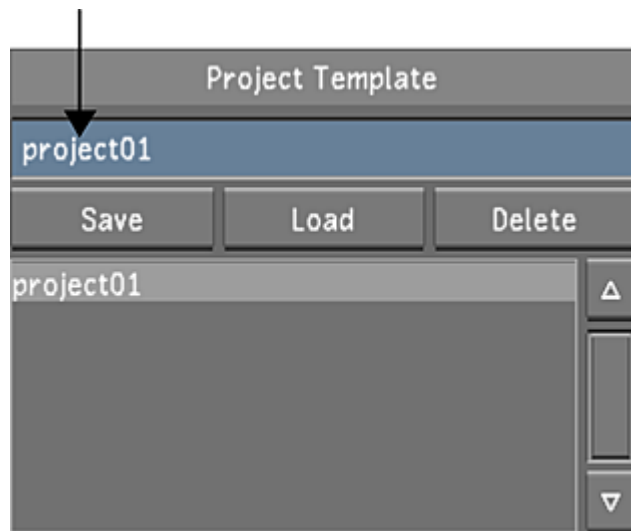
To create a new project template:

- 1 Do one of the following:
 - From the Main menu, click Setup, then Settings, and then click New in the Project group.
 - From the Lustre splash screen, click New in the Project group.



NOTE If you have a template named *default*, then its settings will be loaded automatically.

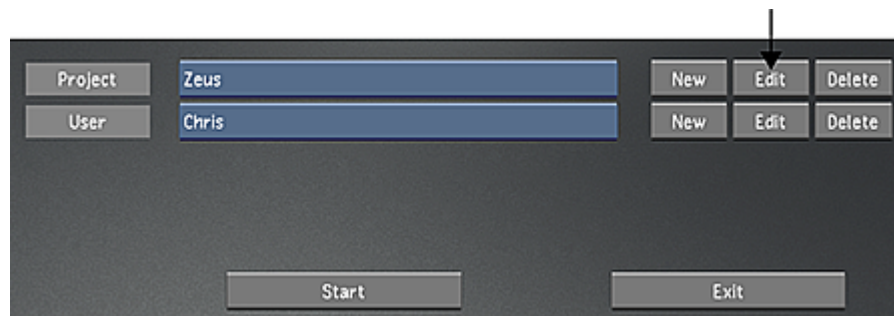
- 2 Configure the settings for the template. Use Reset to reset all settings, from every menu, to their defaults.
- 3 When you are done editing the settings, click Project, and enter a project name in the Project Template field. See [Project Configuration](#) (page 55).



- 4 In the Project Template group, click Save.
- 5 To exit, click Exit Project.

To create a new project template from an existing project:

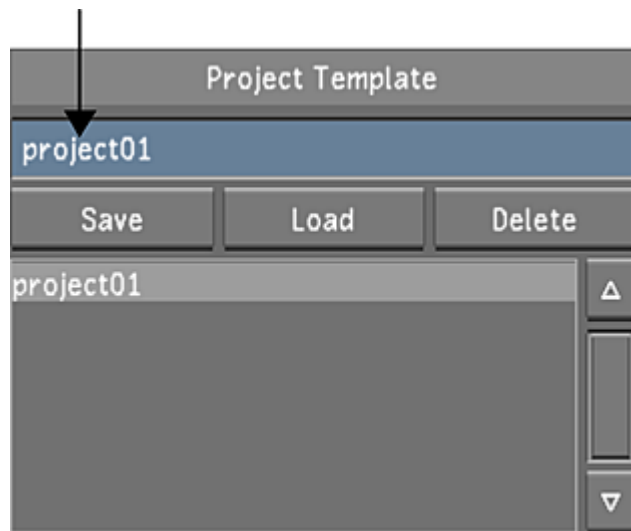
- 1 Do one of the following:
 - From the Main menu, click Setup, and then Settings. In the Project group, select the baseline project, and then click Edit.
 - From the Lustre splash screen, select the baseline project, and then click Edit in the Project group.



- 2 Configure the project. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).

WARNING Rename the new project, or you will overwrite the original project's settings with the new settings.

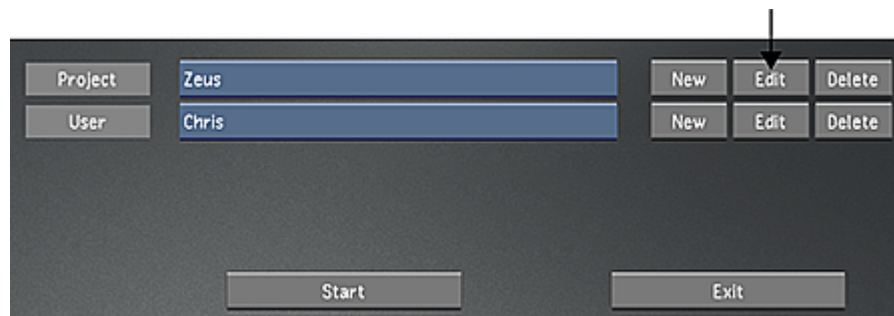
- 3 Click Project and enter a name in the Project Template field.



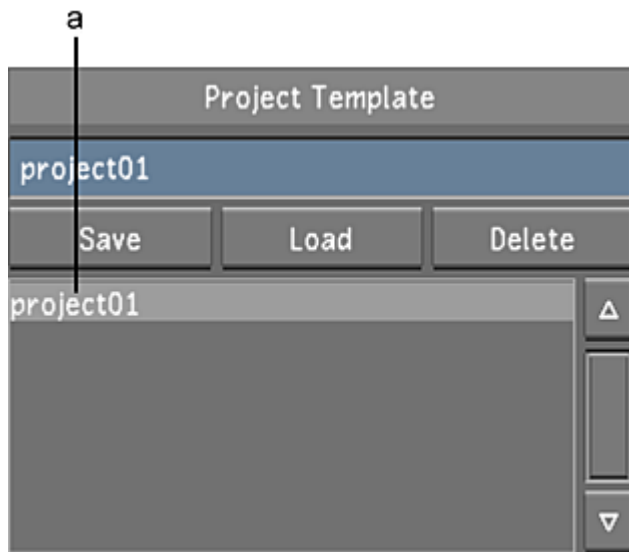
- 4 To save the template, click Save in the Project Template group.
- 5 Click Exit Project.

To create a new project template from an existing project template:

- 1 Do one of the following:
 - From the Main menu, click Setup, and then Settings. Select the project to edit, and then click Edit in the Project group.
 - From the Lustre splash screen, select the project to edit, and then click Edit in the Project group.



- 2 From the Project Template list, select a template.



(a) Project Template list

- 3 Click Load.
- 4 In the Project Template field, enter a new template name, and then click Save.

WARNING Rename the new template, or you will overwrite the original template with the new settings.

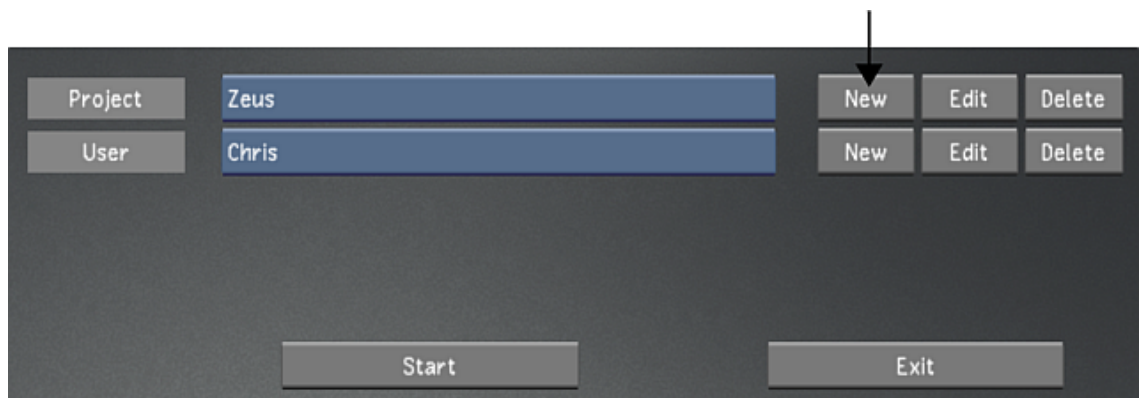
- 5 Configure the template. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).
- 6 To save the template, click Save in the Project Template group.
- 7 Click Exit Project.

Editing a Project Template

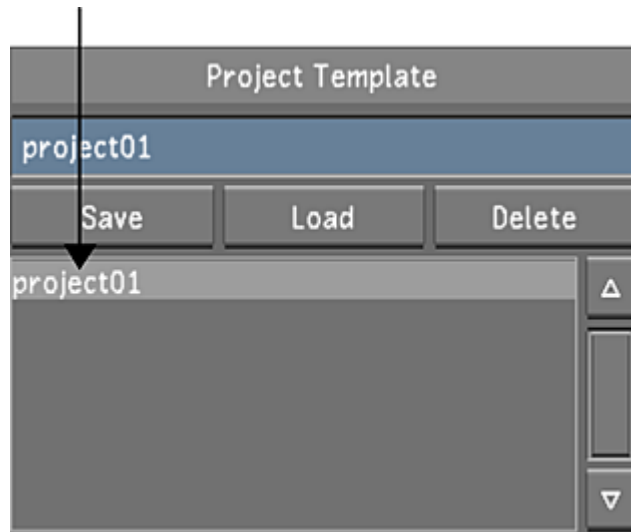
As you create project after project, there may come a time when you need to change a few of the settings and you do not want to create an entire new template. You can accomplish this by using the edit feature.

To edit a project template:

- 1 Do one of the following:
 - From the Main menu, click Setup, then Settings, and then click New in the Project group.
 - From the Lustre splash screen, click New in the Project group.



- 2 From the Project Template list, select the template to edit.



- 3 Click Load.
- 4 Configure the template. Use Reset to reset all settings, from every menu, to their defaults. See [Project Configuration](#) (page 55).
- 5 To save the template, click Save in the Project Template group.
- 6 Click Exit Project.

Creating a User Template

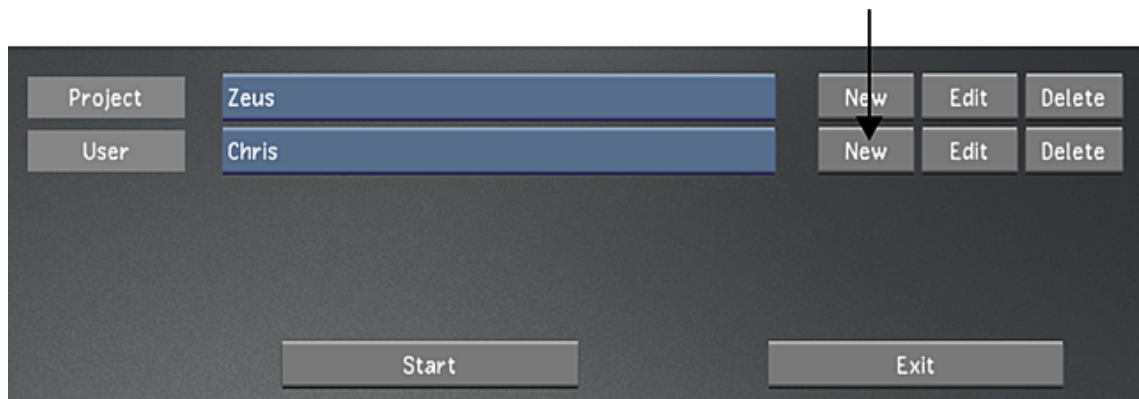
When creating a user, you can save the setup as a template for other users.

From the User Template section in the Display & Interface settings, you can do the following:

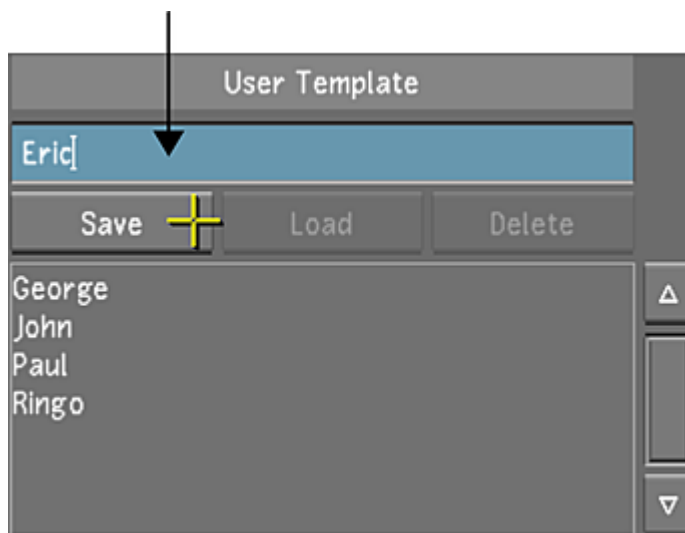
- Create a new user template.
- Create a new user template from an existing user profile.
- Create a new user template from an existing user template.

To create a new user template:

- 1 Do one of the following:
 - From the Main menu, click Setup, then Settings, and then click New in the User group.
 - From the Lustre splash screen, click New in the User group.



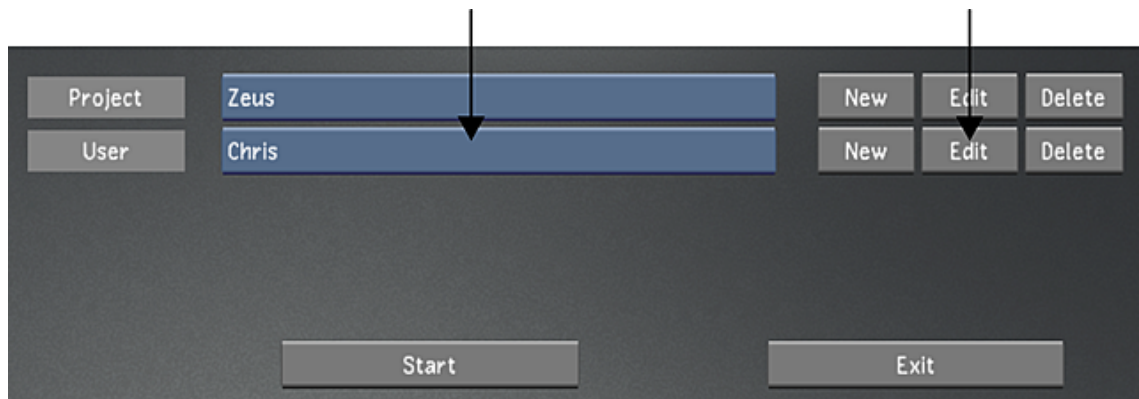
- 2 Configure the new user. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 3 Click Display & Interface, and enter a name in the User Template field.



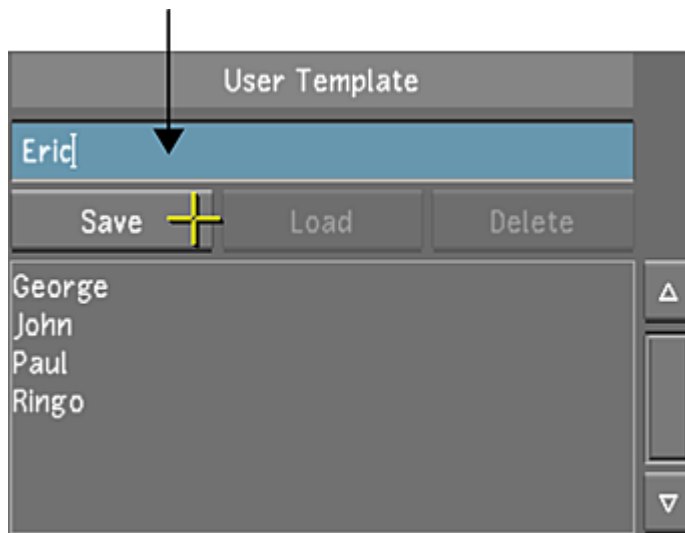
- 4 To save the template, click Save in the User Template group.
- 5 Click Exit User.

To create a user template from an existing user profile:

- 1 Do one of the following:
 - From the Main menu, click Setup, and then Settings. Select the baseline user, and then click Edit in the User group.
 - From the Lustre splash screen, select the baseline user, and then click Edit in the User group.



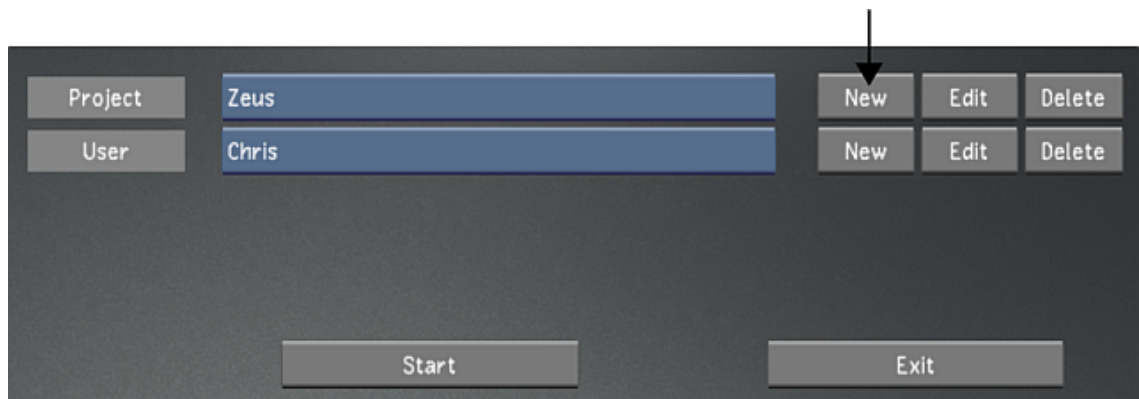
- 2 Configure the new template. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 3 Click Display & Interface and enter a new name in the User Template field.



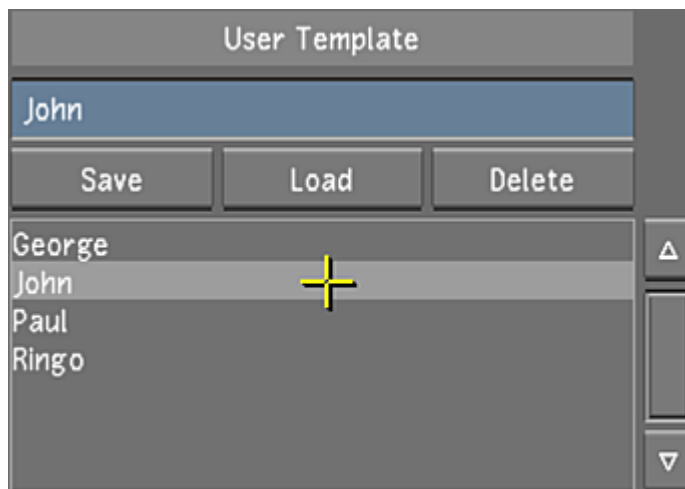
- 4 To save the template, click Save in the User Template group.
- 5 Click Exit User.

To create a new user template from an existing user template:

- 1 Do one of the following:
 - From the Main menu, click Setup, then Settings, and then click New in the User group.
 - From the Lustre splash screen, click New in the User group.



- 2 From the User Template list, select the template to use as baseline.



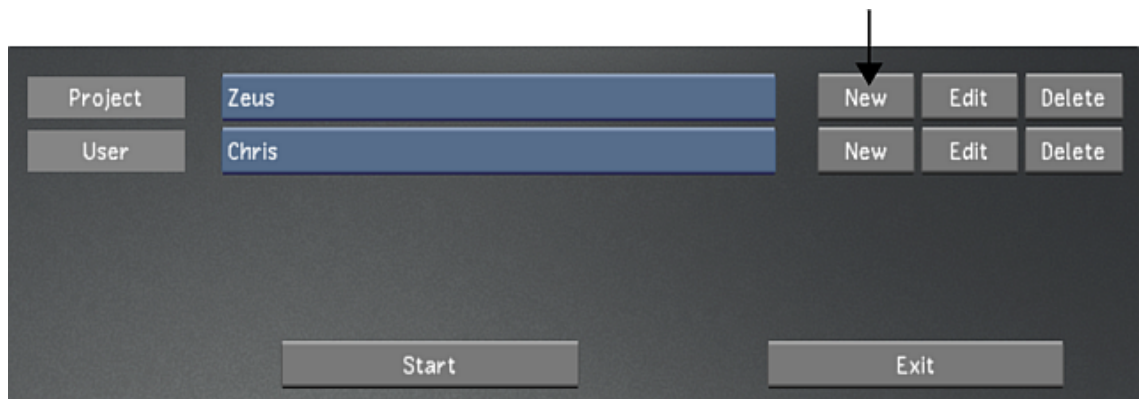
- 3 Click Load.
 - 4 In the User Template field, enter a new template name, and then click Save.
- WARNING** Rename the new template, or you will overwrite the original template with the new settings.
- 5 Configure the template. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
 - 6 From the User Template list, select the new template.
 - 7 To save the template, click Save in the User Template group.
 - 8 Click Exit User.

Editing a User Template

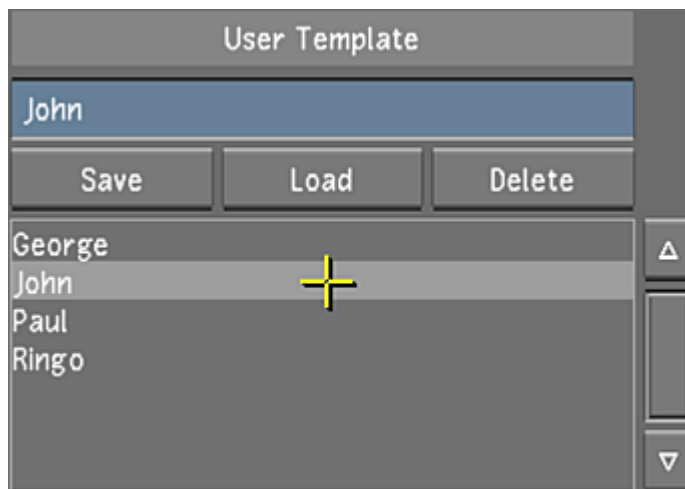
The template editing feature is available for you to make minor changes to existing templates as they are needed.

To edit a user template:

- 1 Do one of the following:
 - From the Main menu, click Setup, then Settings, and then click New in the User group.
 - From the Lustre splash screen, click New in the User group.



- 2 In the User Template group, select the user template to edit.



- 3 Click Load.
- 4 Configure the template. Use Reset to reset all settings, from every menu, to their defaults. See [User Configuration](#) (page 81).
- 5 To save the template, click Save in the User Template group.
- 6 Click Exit User.

Basics

7

This chapter introduces basic functionality for Lustre. It provides an overview of the user interface and control surfaces, and explains global features such as undo/redo and the Grade bin.

Starting and Exiting Lustre

Lustre:startingLustre:exitingTo start Lustre, use any of the standard methods for opening an application in Windows or Linux.

To start Lustre:

- 1 Start the application by double-clicking the desktop icon, or by doing one of the following:
 - If using the Windows version of Lustre, select Start | Programs | Autodesk | lustre from the Windows task bar.
 - If using the Linux version of Lustre, it is recommended to log into the Lustre environment. If you open a Linux shell, it will automatically place you in the Lustre directory:

/usr/Autodesk/<lustre version>/

Next, start Lustre. Type:

./lustre to start the Lustre application.

Lustre starts with all the settings you used when you last exited. For example, it loads the project, cut, and grade you were working with and places the positioner on the frame you were on.

NOTE If Lustre cannot find a license, the Flex LM® wizard appears, requesting the location of the license file.

To exit Lustre:

- 1 In the Main menu, click Setup.
- 2 Click Exit and confirm.

TIP You can also exit the application by pressing SHIFT + Insert.

Understanding the Lustre User Interface

The Lustre user interface is divided into four main sections.



Footage courtesy of EVN PRODUCTIONS (a) Player display controls (b) Player (c) Storyboard (d) Menu

Most sections display different kinds of information, depending on user preferences and the action being performed.

The Player

This section of the user interface is generally used for viewing the currently selected shot in the Storyboard. However, you can also use it to:

- Display the Library and file browser in order to select footage to add to the Storyboard. See [Browsing for Footage](#) (page 191).
- View and modify EDL details. See [Working with EDL, ALE, and Cutlist Files](#) (page 233).
- Display Colour menus. See [Displaying Colour Menus in the Player](#) (page 398).
- Monitor capture progress. See [Capturing Material](#) (page 646).

The Storyboard

Use the Storyboard to select shots, arrange shots, navigate through shots, and isolate certain types of shots. Using hotkeys, you can also copy grades to shots via the Storyboard. See [Navigating through Shots](#) (page 322) and [Storyboard Viewing Options](#) (page 326).

Player Display Controls

Below the Storyboard, there are controls for:

- Resetting the current menu. See [Resetting Parameters](#) (page 133).
- Bypassing the current menu. See [Bypassing Menu Parameters](#) (page 134).
- Undoing and redoing actions. See [Undoing and Redoing Actions](#) (page 135).
- Setting play and view options for shots. See [Playing, Viewing, and Sorting Shots](#) (page 315).
- Adjusting printer light settings. These display only when a Colour menu is active. See [Adjusting Printer Lights for Primary Grading](#) (page 418).
- Setting keyframes automatically. See [Animating Reposition Values](#) (page 376) and [Animating with Keyframes](#) (page 547).

The Menu Section

The menu section in Lustre is organized from left to right. The first column of buttons are the main menus. Clicking a main menu displays its sub-menu buttons in the next column. Clicking a sub-menu displays its functions in the central part of the menu. Menu functionality is addressed by other chapters in this guide.

On the right side of the menu are features that, for the most part, are globally applicable. These features include:

- The Notes window. See [Assigning Notes to Shots](#) (page 137).
- The Flags system. See [Flagging Shots](#) (page 138).
- Grouping functionality. See [Creating Shot Groups](#) (page 141).
- The Selector. See [Copying Parameters with the Selector](#) (page 146).
- The standard Lustre calculator. See [Assigning Values With the Standard Lustre Calculator](#) (page 149).
- The Grade bin. See [Using Grade Bins](#) (page 151).

Working with Control Surfaces

Lustre supports the Tangent Element control surface, the Tangent CP100 control surface and the Autodesk control surface (ACS). All three control surfaces improve interactivity when colour grading film and video footage, and allow you to accomplish many of the tasks you do in the Lustre user interface.

See [About the Tangent Element Control Surface](#) (page 765)

See [The Tangent CP100 Control Surface](#) (page 875)

See [The Autodesk Control Surface](#) (page 809)

Resetting Parameters

parameters:resettingresetting:parametersYou can reset parameters on a shot-by-shot basis. You can either reset a parameter, reset all parameters in a menu, or reset a shot to its original state.

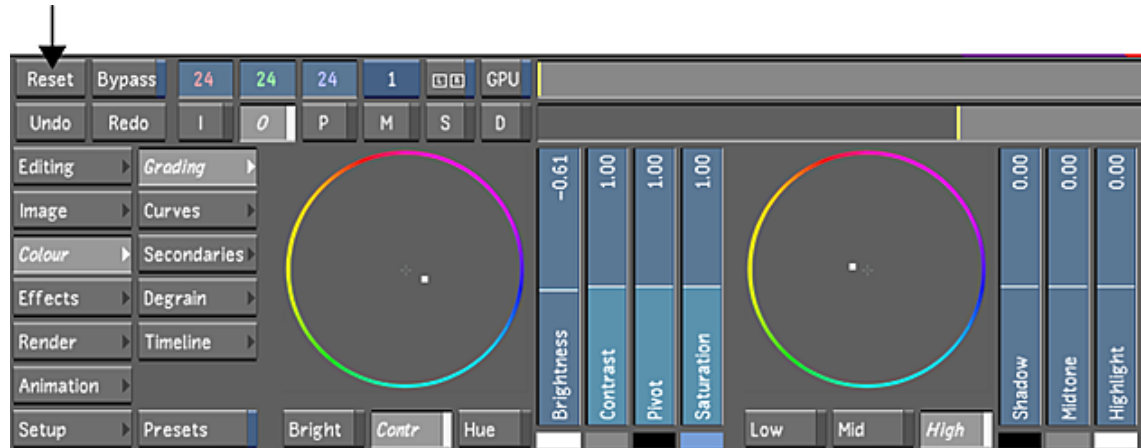
To reset a parameter:

- 1 After making a change to a parameter, hold down the **Ctrl** key and then click the parameter (field, graph, or option).

The parameter is reset.

To reset all parameters for a menu:

- 1 Select the shot you want to reset.
- 2 Access the menu you want to reset.
- 3 Click Reset, and then confirm.



The menu is reset.

To reset a single shot to its original state:

- 1 Select the shot that you want to reset.
- 2 Press the R key twice.

TIP You can also double-click an unused storage container in the Grade bin to remove any grade or repositioning from the selected shot.

The shot is reset to its original state.

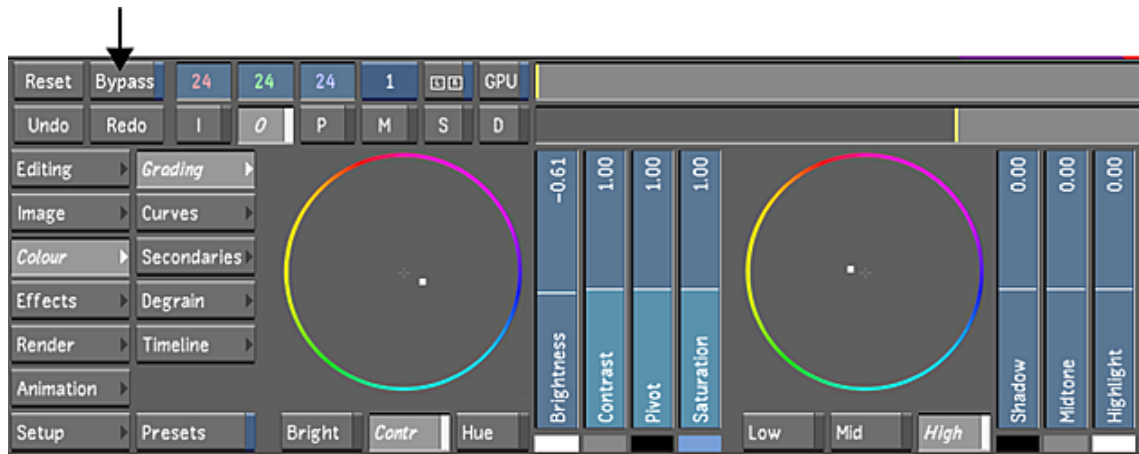
Bypassing Menu Parameters

parameters:bypassingbypassing:menu parametersYou can bypass the parameters of a single menu or all menus to view a shot as if the menu or menus had not been modified. Do this when you want to compare the original shot to the modified shot. Bypassing differs from resetting in that you can toggle Bypass on and off, whereas you have to undo a reset operation to return to the previous state. By toggling Bypass off and on, you can easily compare the original shot to the modified one. You can bypass the following menus either singly or simultaneously:

- Grading
- Curves
- Secondarys
- Effects

To bypass menu settings:

- 1 Load the selected modified shot into the Player.
- 2 To bypass a single menu's parameters, click Bypass or use the B keyboard shortcut..



3 To bypass all menu parameters, do one of the following:

- Shift-click Bypass.
- Press Shift+B.

Changes made to the current menu are temporarily turned off.

4 Enable Bypass again to turn the menu back on.

In a stereoscopic project, you can use the Bypass feature on the Left Eye and Right Eye layers. See [Bypassing Menu Parameters of an Eye](#) (page 588).

Color Coding for Bypass

- **Green Outline with Bypass button enabled:** The current menu is set to Bypass
- **Green Outline with Bypass button disabled:** One or multiple menus (other than the current menu) is/are set to Bypass.
- **Green Outline with Bypass button grayed-out:** One or multiple menus are set to Bypass while the current menu cannot be bypassed.
- **Green Outline and Bypass written in Pink:** All menus supporting Bypass are enabled (bypassed).

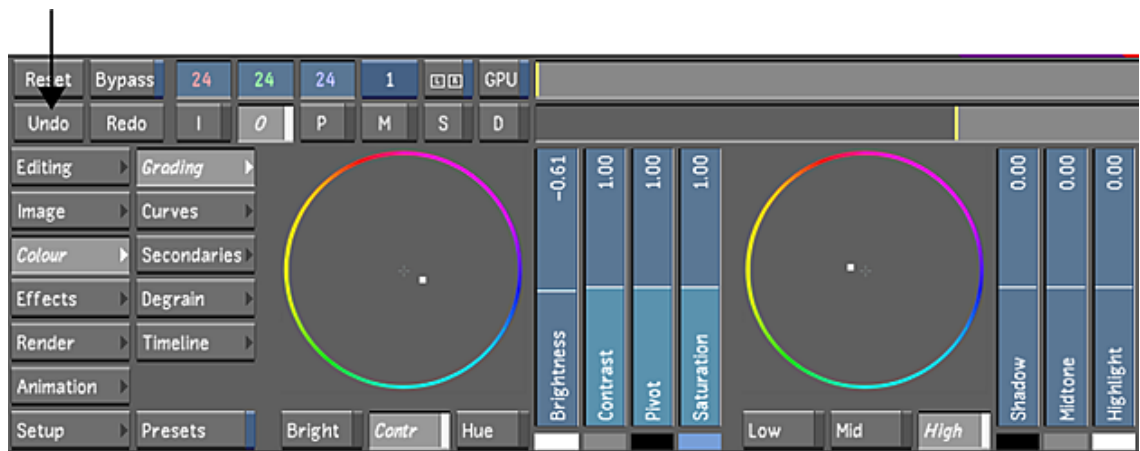
Undoing and Redoing Actions

redoing:actionsundoing:actionsEach shot in Lustre has its own undo and redo history.

You can undo most operations in Lustre. You can use Redo immediately after undoing an operation.

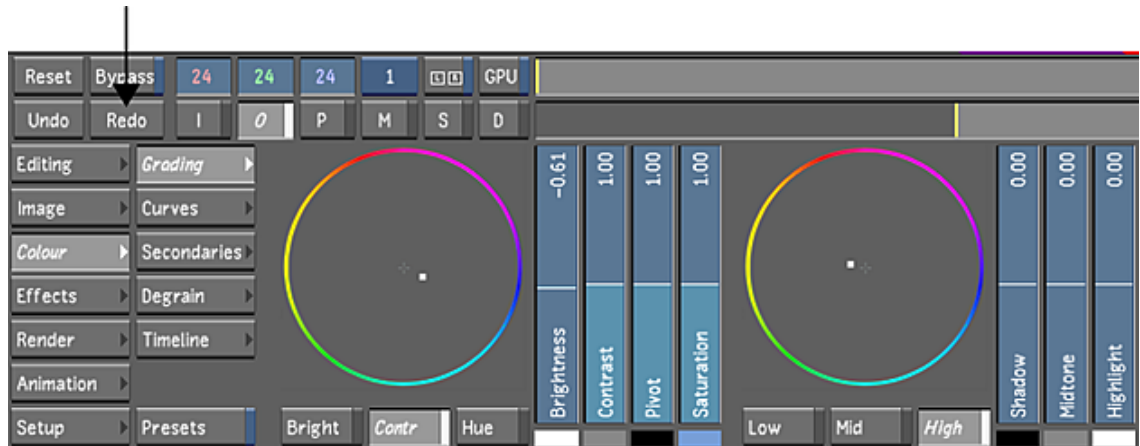
To undo an operation:

- 1 After performing an operation that you want to undo, click Undo.



To redo an operation:

- 1 After undoing an operation, click Redo.

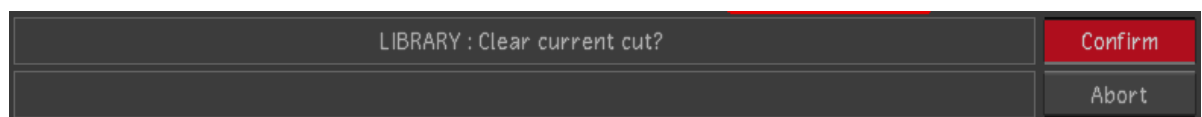


Confirming and Cancelling Actions

cancelling, actionsconfirming, actionsThere are several operations in Lustre that must be confirmed before they begin. For example, when rendering, capturing, playing out, or deleting material, you must first confirm the action.

When you launch an action that must be confirmed, the Message Bar will show a message asking you to confirm or cancel the action and a red Confirm button along with a grey Abort button will appear to the right of the Message Bar. Click the appropriate button to confirm or abort the action.

NOTE The Message Bar is exclusive to Lustre 2012 Extension 1. In prior versions of Lustre, there is simply a Confirm button.



TIP You can also click anywhere in the grey area of the menu to cancel the action.

Assigning Notes to Shots

shots:assigning notesnotes:assigning to shotsThe Notes window is available from almost every menu and allows you to enter unlimited wrapping text pertaining to the current shot. Notes are retained as you jump from one shot to another, and saved when you save the grade.

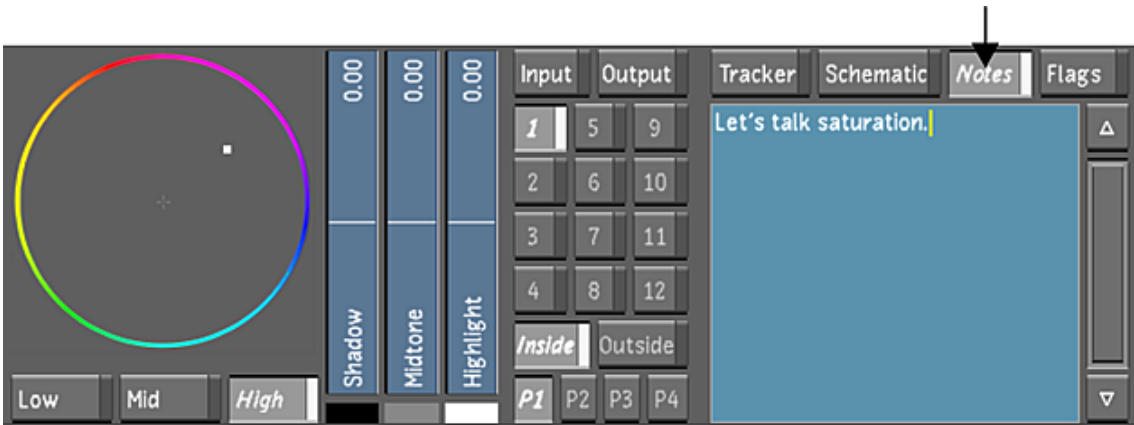
Notes are saved to an .XML file in the scene's *Library* directory. The file is identifiable by a *.desc.xml* extension. You can open the DESC file in a text editor to view and make changes that will be reflected in Lustre the next time you load the grade. This could be useful if, for example, you wanted to review the notes for each shot between grading sessions. You would copy the file to a laptop, and then copy it back to the scene's *Library* directory if any changes were made. See [XML in Lustre](#) (page 749).

When activating the On-Screen View mode (Ctrl+W), the notes you added to the shot are displayed alongside the shot name.

When editing the DESC file, only the Notes field should be changed. Editing any other field could produce unexpected results.

To use the Notes window:

- 1 Enable the Notes button.



This displays the Notes window below the Notes button.

You can use any of the following standard text editor functions when drafting notes.

Press:	To:
cursor arrows	Move up, down, left or right.
Ctrl+A	Select all text.
Backspace, Delete	Delete text.
Home	Jump to the start of the current line.
Ctrl+Home	Jump to the start of the text.
End	Jump to the end of the current line.
Ctrl+End	Jump to the end of the text.

Press:	To:
Page Up	Jump one text screen up.
Page Down	Jump one text screen down.
Shift+cursor arrow or left mouse button-drag	Select text.
Ctrl+A	Select all text.
Enter	Add an empty line.
Esc or click outside the text editor	Disable the text editor.

NOTE Lustre hot keys are not functional while the Notes text editor is enabled.

- 2 Save the scene's notes by saving the grade. See [Creating a Grade Version for a Cut](#) (page 105).

Flagging Shots

shots:flaggingflagging shotsThe flag system is accessible from almost any menu and allows you to enable and disable flags, create and delete flags, and copy flag states to one or more shots.

NOTE When in the timeline or the colourist's timeline, the flag system is always displayed to the right of the timeline canvas.

System flags are available by default for all shots.

Render Flags the shots to be rendered.

ShotReactor Flags the shots to be rendered using ShotReactor.

Changed Indicates whether or not the current shot has been modified since the last save.

Locked Locks the current shot to prevent modifications. The shot's locked status is also indicated by the word Locked that spans the three printer light fields.



Shot Priority Assigns priority to the current shot in the timeline. See [Shot Priority](#) (page 305).

Notes Denotes whether notes exist against the current shot. Unlike the other system flags, the Notes flag cannot be turned on or off. Instead, its state is automatically updated depending on the contents of the Notes window. The Notes flag is set only when content is added to the Notes window. See [Assigning Notes to Shots](#) (page 137).

CDL Indicates whether or not CDL data is applied to the current shot.

- When importing CDL or SDL data from an EDL, a flag is displayed on the shots to which CDL or SDL data was imported.
 - CDL data import displays a light purple triangular flag.
 - CDL Change displays a light green triangular flag
 - SDL data import displays a green triangular flag.
 - SDL Change displays a purple triangular flag.
- For revision purposes, you can rename these flags to whatever you wish and, when new CDL or SDL data is imported from EDL, the flag returns to its default name, enabling you to track changes over time.
- You can now invert the selection of flagged shots, from the Flag List. Holding ALT while clicking on the Select button, inverts the current selection.
- When moving a Flag or a Group in the Flag List, the Flag List is now updated and displays the actual position of the moved item.
- The S3D EDL Export option is now named SDL.
- CDL and SDL ordering is now streamlined between the Cut and the Assemble menus.

You can Add / Remove a Flag while playing back a grade. To do this, right-click on the Flag you want to add/remove. The playback will not stop. It is also possible to create a new Flag and enable/disable the visibility of the flag while playing back.

Important note concerning SDL Aspect Ration Data:

- Aspect Ratio data is now correctly written in the DolbyVision XML file. The specification of Stereo Decision List (SDL) comments has been changed to reflect the StereoD SDL specification (V0.25, 2016). The EDL comment must be defined with a space between the * and the name of the comment, as seen in the following example:
`001 A046 V C 00:00:42:04 00:00:51:11 01:03:24:14 01:03:33:21 * FROM CLIP NAME: ABC_0010 * SDL_HIT: (0,-10) * SDL_FWL: (1,0)(10,0)(15,-10) * SDL_FWR: (10,-25)(15,-35)`
- Lustre is still able to read an SDL with or without a space between the * and the comment. The SDL data must be expressed in "(keyframe,value)". Previous versions of Lustre supported "(value,keyframe)". The specification change also affects how Lustre exports SDL data in EDL.
- These changes do not affect grade data created in previous version of Lustre. They only affect how a CMX-3600 EDL that contains SDL data is read. If you have a legacy EDL, which expresses SDL data in the legacy format, you can add a keyword in the Lustre "init.config" file, in order to use the legacy SDL information: In the "Miscellaneous" section of the init.config file, you will find: `<ReverseSDLKeyDataOrder state="Off" />` By setting this keyword to 'On', legacy mode becomes available for SDL Import & Export.

To access the Flags window:

- 1 Enable the Flags button.
This displays the flags for the current shot.

To enable or disable a flag:

- 1 Right-click the flag row.
When the flag is enabled, the flag name is in colour and its circle is filled.
- TIP** To select a flag without enabling or disabling it, left-click the flag row.

Applying the Current Flag to the Event Portion of an EDL

You can apply the current Flag ([]) to the event portion of an EDL. This functionality allows the use of events in an EDL to propagate a Flag to the matched event in the current cut:

- Set a Flag as the current Flag, by clicking the “[]” area in the Flag list.
- Go to the Editing / Assemble menu.
- Import an EDL.
- Press the Flag Load button (All or Selected option). A Conformation dialog is displayed and all matched events show the Flag.

NOTE

- You can use the [keyboard shortcut to disable the Render flag functionality. The same keyboard shortcut can be used to disable a single flag, when selected. This key remains available even if the Flag list is not enabled.
 - You can use the] keyboard shortcut to enable the Render flag functionality. The same keyboard shortcut can be used to enable a single flag, when selected. This key remains available even if the Flag list is not enabled.
-

Custom Flags

Apart from the system flags (displayed in bold), you can also create your own custom flags. When creating a custom flag, you must adhere to the following:

- You cannot rename a system flag, nor can you assign the name of a system flag to a custom flag.
- Spaces are not supported in the naming convention. It is recommended that underscores be used instead of spaces when you are working on either Linux or Windows.

Custom flags are saved to the *custom.flags* file in the Lustre version folder. Consequently, the custom flags are applied globally on all projects. After you create a custom flag, newly created grades save the *custom.flags* data to the *grdXX.desc.xml* file in the project's *Library* folder.

To create a custom flag:

- 1 Click New under the Flags window.
A new flag is added to the bottom of the list.
- 2 To rename the custom flag, middle-click it and enter a new name.
- 3 To cycle the order of custom flags, select the flag you want to move and press the Up / Down arrows to cycle the flag from bottom to top. Single selection only.

To define the shape of a custom flag:

- 1 Middle-click the flag icon to cycle through Circle, Square and Triangle.
- 2 Shift-Middle-click the flag icon to cycle between 16 colors.

NOTE The color, shape and position of system flags cannot be modified.

To delete a custom flag:

- 1 Select the flag and click Delete under the Flags window. Hold Ctrl while clicking Delete, to delete the flag without confirmation.

NOTE System flags cannot be deleted. When deleting custom flags, only one can be selected at a time.

To copy a custom flag's state to all shots:

- 1 Select the Custom flag (the selected flag will be highlighted).
- 2 Click Set All in the Flag controls.

To copy a custom flag's state to one or more shots:

- 1 Select the Custom flag (the selected flag will be highlighted).
- 2 Select the shots in the Storyboard or Multi-Layer Timeline by doing one of the following:
 - Right-click the shots you wish to flag in the Storyboard.
In the Storyboard, the borders of the selected shots will turn aqua in colour.
 - Select the shots you wish to flag in the Multi-Layer Timeline. See [Selecting Elements](#) (page 283).
In the Multi-Layer Timeline, the selected shots will turn yellow in colour.
 - Create a shot group, then select the group. See [Creating Shot Groups](#) (page 141).
- 3 Click Set Sel.

Creating Shot Groups

You can group shots together. This is useful, for example, when you have a series of exterior shots and a series of interior shots in the Storyboard. You can define a group for the exterior shots and another group for the interior shots. When you want to adjust parameters for the exterior shots, you select that group. Then, when you want to work on the interior shots, you select the Interior Shots group. Each time you select a different group, the selected shots in the Storyboard change.

In addition to being able to group shots, you can also define what parameters are relevant for the group. In the Exterior Shots group example, you may want to group Primary colour and Effects, but not Secondary colour. This allows you to perform primary colour grading on all shots in the group, but secondary colour grading is applied only to the current shot.

If, at any point, you need to apply changes to a parameter defined as part of a group, but you want the changes to apply to the current shot only, use Solo. This function temporarily isolates the shot for modification—your changes are not applied to other shots in the group.

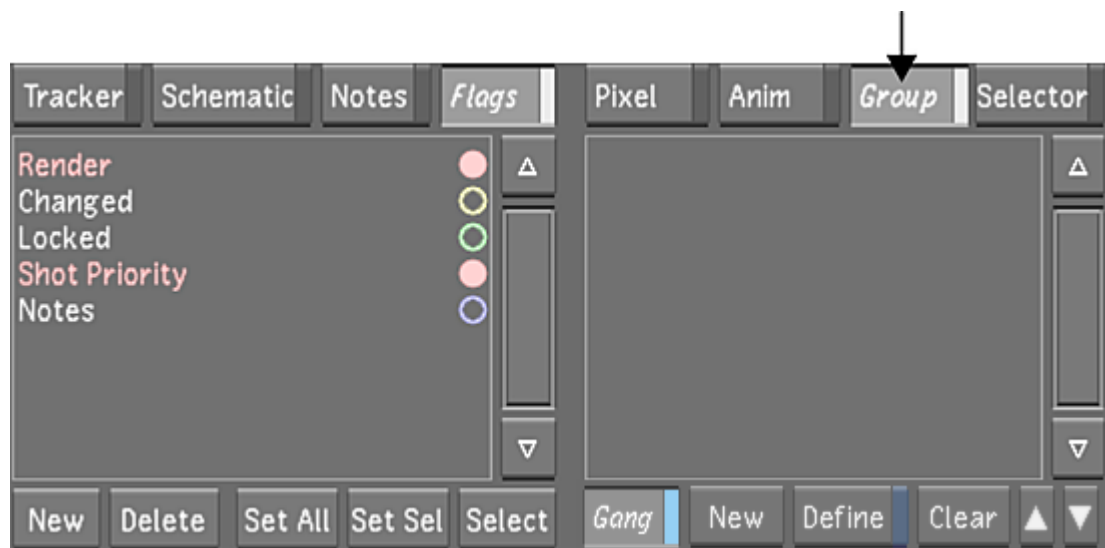
Grouping Shots

shots:groupinggrouping:creating a shot groupUse the Group tool to select shots to group and the parameters to include with the grouping. Any change made to one shot in the group propagates to the other shots in the group, provided that the changes are to parameters that have been included in the group.

Changes made to grouped shots are relative, not absolute. For example, if a non-grouped shot's printer light values are 25, 25, 25 and a new setup is loaded in which the printer light values are 37, 28, 10, then the shot's printer light values will be changed to 37, 28, 10. On the other hand, if the shot were part of a group, the new printer light values would be added, resulting in printer light values of 62, 53, 35. When in group mode, values are added to all the grouped shots, even those that have already been colour corrected.

To create a shot group:

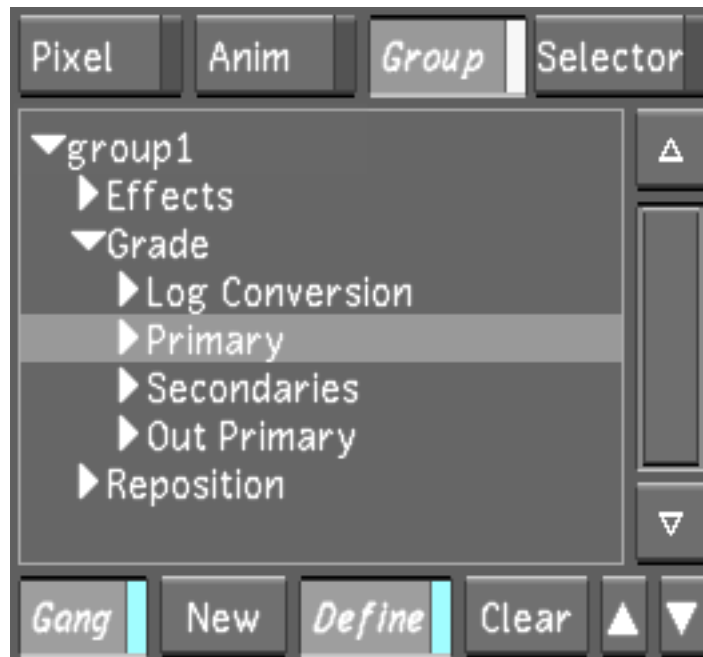
- 1 Click Group.



NOTE You can access the Group button from any menu except the Animation menu.

2 Click New.

A new group called group1 is created and the Define button is enabled. This allows you to add shots to the shot group and select the parameters that are applied to the grouping.

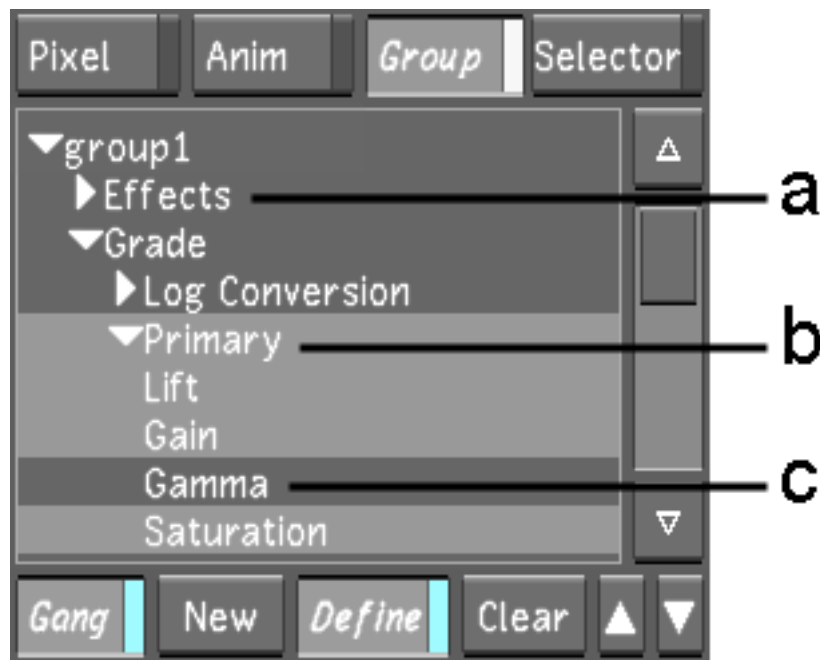


3 Right-click shots in the Storyboard to add them to the group.

Grouped shots are highlighted with a yellow border.

4 Select the channels in the list for the parameters that you want to apply to the group:

- To select all channels in a directory, select the directory.
- To select a subset of the channels in a directory, click the arrow to the left of the directory to expand the directory, and then select the channels.
- To deselect a directory or a channel, click it.



(a) Deselected directory (b) Selected expanded directory (c) Selected channel

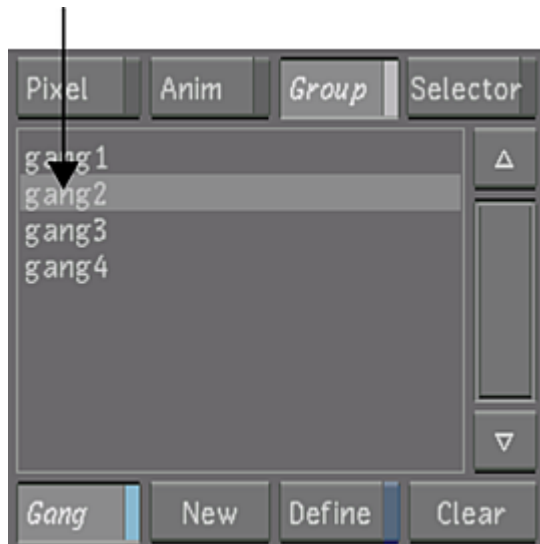
- 5 When you have finished setting up the group, disable Define.
- 6 You can name the group by middle-clicking the group and entering a new name.
NOTE Spaces are not supported in naming conventions. It is recommended that underscores be used instead of spaces when working on either Linux or Windows.
- 7 You can delete a group by selecting it and pressing *Delete*, while the cursor is placed over the group menu.
- 8 You can organize the Groups in the Group List, using Up/Down arrows to move the position of the currently selected Group.
- 9 You can activate split view with grouped shots by right-clicking the group.

Applying Changes to Grouped Shots

shots:applying changes to a groupgrouping:applying changes to shots as a groupAfter you group shots, changes made to one shot are applied to all other shots in the group.

To apply changes to all shots in a group:

- 1 Click Group.
- 2 Select the group to which you want to make changes.



The grouped shots are selected in the Storyboard.

- 3 Enable the Solo/Gang button.



The Solo button turns to a Gang button and the grouped shots are outlined in yellow.

- 4 Select one of the grouped shots and make modifications to it.

NOTE You can also apply a grade to one of the shots.

The changes are applied to all the other grouped shots.

Soloing Shots

grouping:soloing shots in a groupshots:soloingUse Solo to temporarily disable grouping for a shot.

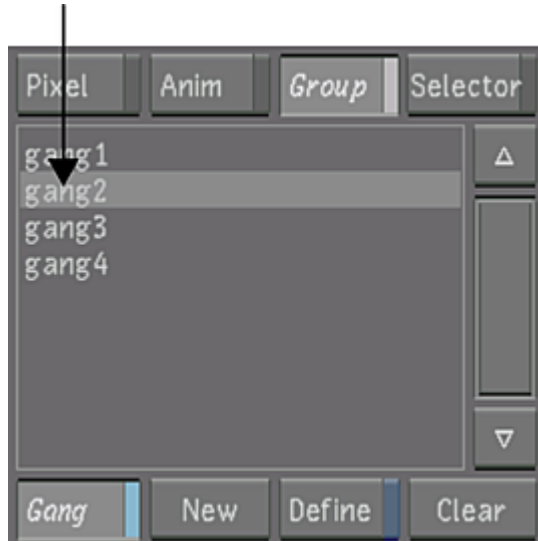
When Solo mode is enabled, you can only modify the current shot. You can copy grades (drag and drop from the Selector or from the Grade bin) only to the current shot. It is possible to copy a grade from any shot to the current shot.

In Solo mode, the outline around the ganged shots is grey.

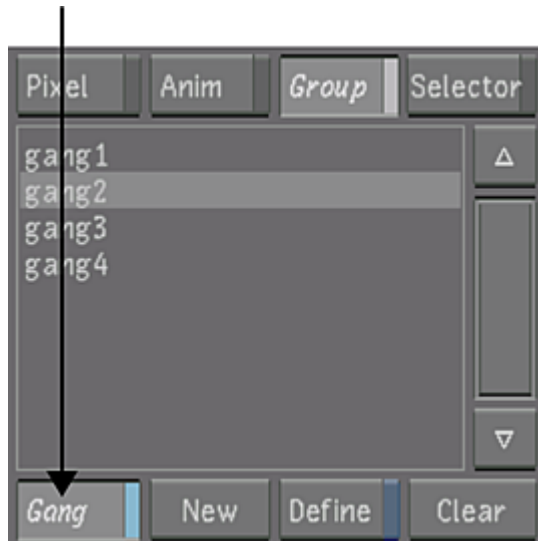
- Group (Gang mode): all shots from the gang can be modified.
- Group (Solo mode): only the current shot can be modified.

To solo shots in a group:

- 1 Click Group.
- 2 Select the group with the shot you want to solo.



- 3 In the Storyboard, select the shot to which you want to make changes.
- 4 Disable the Solo/Gang button.



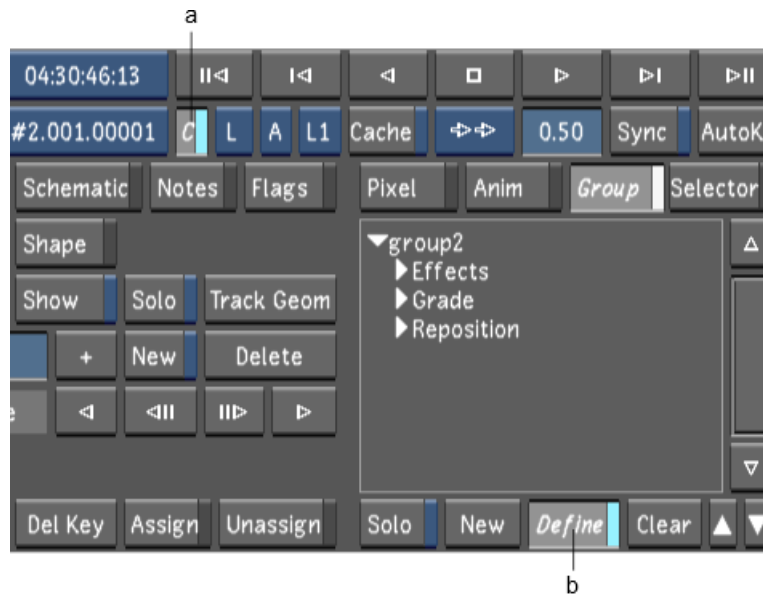
The Gang button turns to a Solo button.

- 5 Make the changes to the shot.
The changes affect the soloed shot only.
- 6 Enable the Solo/Gang button to turn off solo.
Any changes made to the shot are now applied to all grouped shots.

Reordering Shots in a Collapsed Group

You can select multiple shots within a group and collapse the selection to view only the selected shots in the Storyboard. When displaying a collapsed group in the Storyboard, you are able to reorder the shots in the storyboard, without making editorial changes to the sequence. This is useful when you have certain types of shots (interior, exterior, close-up shots of an actor, for example), that you want to view together for grading.

- 1 Create a Group. See [Grouping Shots](#) (page 141).
- 2 Select the shots you want to include in the collapsed Group, by right-clicking them in the Storyboard.
- 3 Enable the Collapse button.



(a) Collapse button (b) Define button

- 4 Enable the Define button.
You can now reorder the shots by dragging and dropping them within the collapsed Group.
- 5 Grade the grouped shots.
- 6 Disable the Collapsed button.
The reordered shots are returned to their original location in the sequence.

Copying Parameters with the Selector

copying:parameters with the SelectorSelector:copying parametersUse the Selector to copy channel parameters from the current shot to other selected shots in the cut. This feature is useful when you have a series of shots that need to have a similar grade applied to them, for example, shots that are too dark. You can adjust the brightness for the current shot, select all the shots, and then copy the grade setting to all other selected shots. For more information about using the Selector to copy grading information in the Multi-Layer Timeline, see [Copying Grading Information in the Colourist Timeline](#) (page 411).

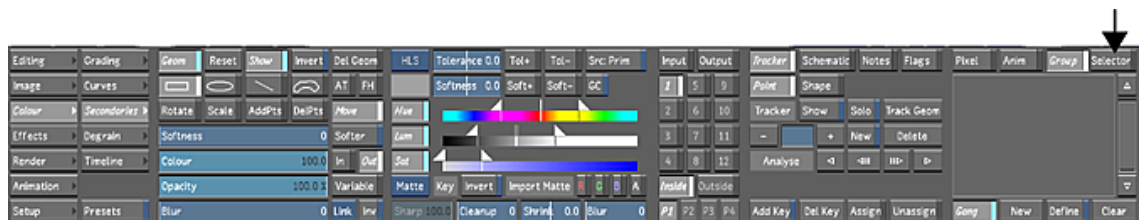
You can also use this feature to copy keyer information. For example, if you blurred a shot and adjusted its hue with the HLS Keyer, you can choose to copy only the hue change to the other selected shots; or, if you modified the tolerance and softness of a shot with the Diamond Keyer, you can choose to copy only the tolerance change to another selected shot.

You can copy the following parameters between shots using the Selector:

- Colour grading
- Input LUT (1D LUTs and 3D LUTs) selections
- CDL values
- Transcode Settings
- HDRx Settings (ARRIRAW, RED)
- Repositioning values
- Tracker data
- Effects
- Degrain settings
- Render flag settings
- Look Settings (ARRIRAW)

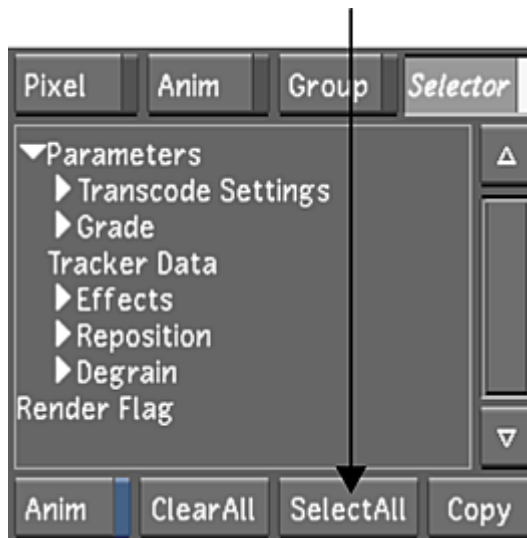
To copy channel parameters from the current shot to selected shots:

- 1 Click Selector.



- 2 Select your target shots by completing one of the following:

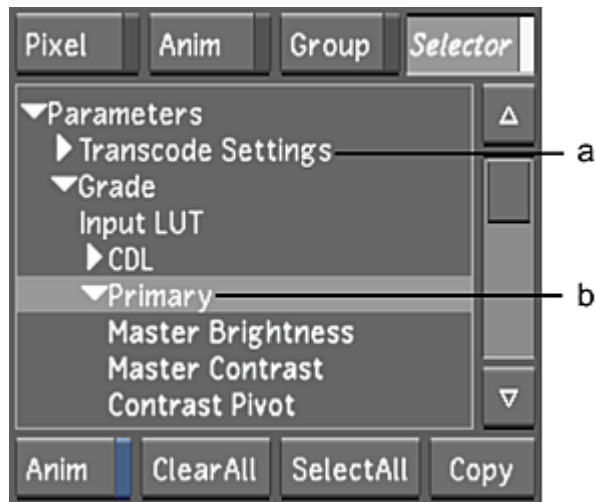
- To select your shots one at a time in the Storyboard, right-click specific shots in the Storyboard.
- To select your shots one at a time in the Timeline, left-click specific shots in the Timeline.
- To select all the shots in the Storyboard or the Timeline, click SelectAll in the Selector.



The target shots are highlighted in aqua.

- 3 Click the shot from which you want to copy parameters.

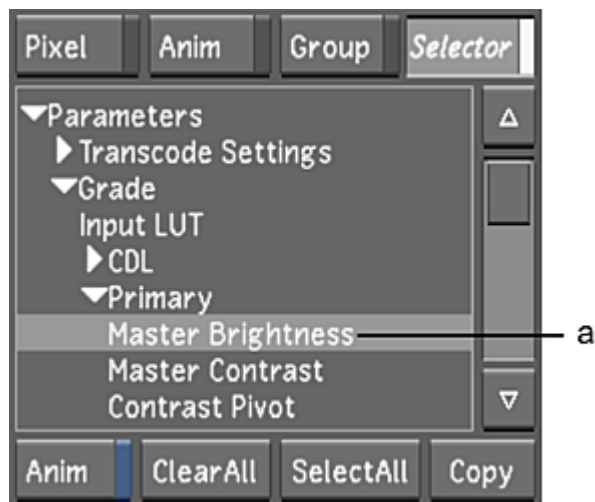
- 4 Specify what parameters to copy by selecting their channels in the Selector channel list:
- To select all the channels in a directory, select the directory.



(a) Collapsed directory (b) Expanded directory

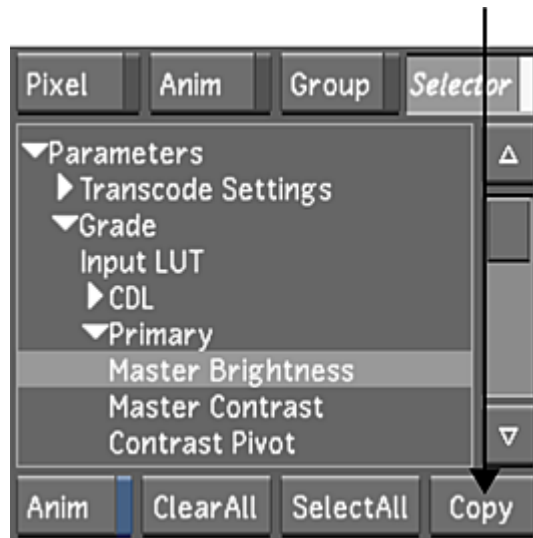
Selected channels are highlighted.

- To select specific channels in a directory, expand the directory and select any of its channels.



(a) Selected channel

- 5 Click Copy.



The parameters for the selected channel are copied to the selected shots.

Copying and Pasting Grading Parameters Between Grading Stages

You can copy or move grading parameters between the Input, Output and any of the Secondary stages with the following key strokes:

- To copy the parameters from one of the grading tabs (Colour/Grading, Colour/Curves or Colour/Secondaries) of the current grading stage (Input, Secondary or Output), to another stage, hold **CTRL** and click the destination stage (Input, Secondary or Output).
- To copy the parameters of all the grading tabs (Colour/Grading, Colour/Curves and Colour/Secondaries) of the current grading stage (Input, Secondary or Output), to another stage, hold **SHIFT** and click the destination stage (Input, Secondary or Output).
- To move the parameters of all the grading tabs (Colour/Grading, Colour/Curves and Colour/Secondaries) of the current grading stage (Input, Secondary or Output), hold **SHIFT + CTRL** and select the destination stage (Input, Secondary or Output). The source stage is reset to the initial values.
- To copy the parameters as defined by the Selector of the currently selected stage (Colour/Grading, Colour/Curves or Colour/Secondaries), hold **ALT** and select the destination stage (Input, Secondary or Output).

See:

[Primary Colour Grading](#) (page 415)

[Secondary Colour Grading](#) (page 443)

Assigning Values With the Standard Lustre Calculator

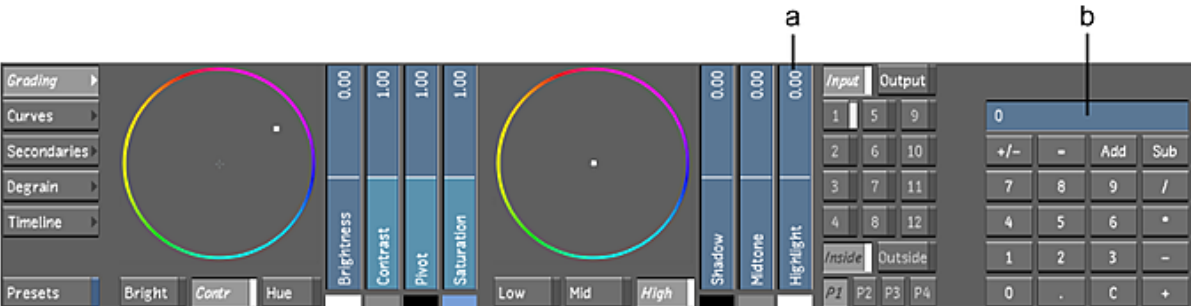
printer lights:accessing the calculator fromzooming:with the calculatorsliders, modifying with the calculatorcalculator:applying values to UI elementsUse the standard Lustre calculator to assign values to sliders and certain fields. You can display the calculator by right-clicking any of the following user interface elements.

Sliders Adjust the value of the currently selected slider.

Zoom field Adjusts the zoom value of the currently selected shot.

Printer Lights Adjust the value of the colour wheel via the printer lights. The calculator displays only after you have already left-clicked in a printer light to display colour wheel values instead of the printer lights. Then, when you right-click a colour wheel value, the calculator appears.

NOTE When you right-click in the timeline Information field, the timecode calculator is displayed. The timecode calculator is used primarily for navigating the timeline. See [Navigating With the Timecode / Frame Counter Calculator](#) (page 325).



(a) Active slider (b) Calculator

NOTE The calculator's default value is always zero.

The calculator features a numeric keypad and buttons for performing standard operations such as addition, subtraction, multiplication, and division. To enter numbers, you can click the calculator buttons, or press the keyboard's number keys or numeric keypad.

It is also possible to assign a negative value to a slider with the calculator.

To assign a negative value to a slider with the calculator:

- 1 Right-click a slider to display the calculator.
- 2 Type '-' on the keyboard.
- 3 Use the calculator to enter the value.

WARNING You must enter the complete number (e.g., 0.654 and not .654).

- 4 Press Enter.

The following hotkeys can be used with the calculator.

Press:	To:
Backspace	Erase the last digit in the calculator's numeric field.
Delete	Reset the calculator's numeric field to zero.
Page Down	Change the sign of the value in the calculator's numeric field.
Up cursor arrow	Add the current calculator value to the slider or field value.
Down cursor arrow	Subtract the current calculator value from the slider or field value.
Enter or click the calculator's active numeric field	Calculate the value, apply it, and close the calculator.

Press:	To:
<code>Enter</code> or click the calculator's = (equals) button	Calculate the value and display the result without applying it.
<code>Ctrl+Enter</code> or right-click the calculator's = (equals) button	Calculate the value, display the result, and apply it.
<code>Esc</code> or click outside the calculator	Close the calculator and leave the slider or field value unchanged.

Using Grade Bins

Grade bins:typesStore shot settings to a Grade bin when you need grades for future reference. Intermediary grades are useful when you want to experiment with different looks. Grades are saved on a shot-by-shot basis and contain all shot and animation settings.

The location of grade files determine how they can be shared between users scenes, and projects.

Grade bin type:	Contains:
Global	Grades saved for use between all users and projects on the current workstation.
Project	Grades saved for the current project only.
Scene	Grades saved for the current scene only.
User	Grades saved for the current user only.
Quick	Grades saved in a user-defined folder. See Defining the Quick Folder (page 167).
Marry	Grades saved as Marry grade files. See Using the Marry Grade Bin (page 151).

TIP Place the cursor anywhere outside the file browser or expanded Grade bin, and press `Shift+-` to cycle through the display of different types of Grade bins.

You can also use Grade bin thumbnails as reference images. See [Viewing Reference Images](#) (page 317).

Using the Marry Grade Bin

Grade bins:Marry files;Marry grades:saving in Grade binUnlike the other Grade bins, which are used to apply grading to any shot(s) in a given timeline, a Marry Grade bin is shot-specific. Each shot in the cut has its own dedicated Grade bin for its Marry grade files. For example, if a cut is composed of three shots, three Marry Grade bins exist, although the only visible Marry Grade bin is the one for the current shot. This allows you to save multiple Marry grades to the same shot.

Marry Grade file information is also displayed in the Grade view. Marry grade files are saved with their source media files (Marry grade files for media imported from Wiretap and Wiretap Gateway are saved with local links to the shots). Enable the Marry button under the file browser to navigate to the file folder in which Marry grades are located. See [Using the Expanded Grade Bin](#) (page 159).

You can also use the Marry grade controls in the Setup > Grade menu to save Marry grade files into the Marry Grade bin. See [Saving and Loading Marry Grades](#) (page 113).

Saving Grades

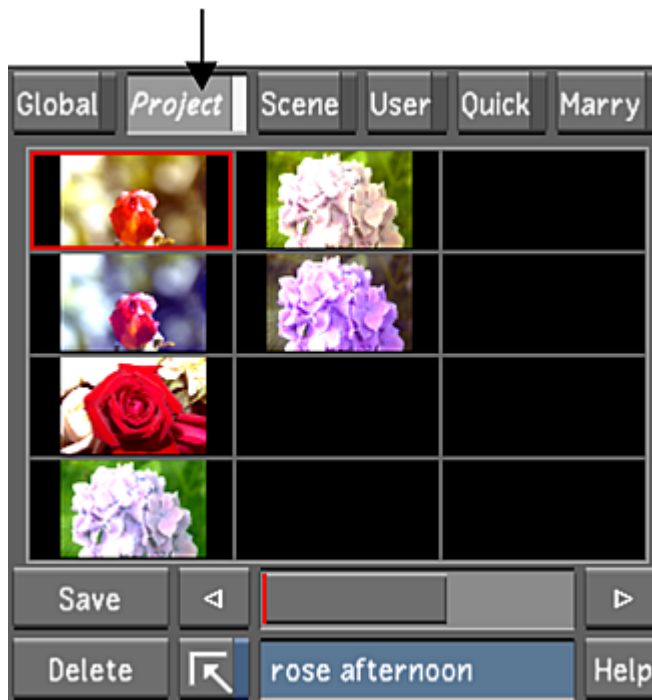
Grade bins:saving grades;saving:gradesYou can save grades to the Grade bin. When you save grades, all the settings are saved with a high-resolution PNG image and a thumbnail for identification. By saving your shot settings to the appropriate Grade bin, you can save your shot settings globally, to a predefined folder, or limit them to a user, scene, or project. You can also save them with your shots as Marry grade files.

If you save grades to a global, project, scene or user Grade bin, each selected grade is saved in a separate storage container, starting from the selected container and proceeding column by column and left to right.

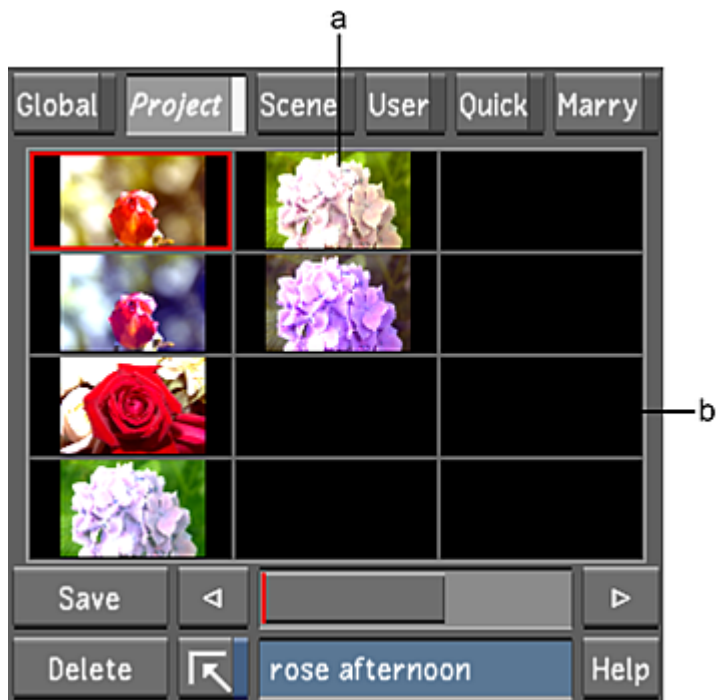
If you save grades to a Marry Grade bin, each selected grade is saved in a separate storage container in the current container position (highlighted in red) in the Grade bin for the shot.

To save a grade to a Grade bin:

- 1 Select the Grade bin you want to use (for example, the Grade bin for the current project).



- 2 (Optional) Scroll to the area of the Grade bin you want to use. To scroll through a Grade bin, middle-click and drag right or left, or use the horizontal slider located immediately below the Grade bin. The red line in the slider indicates the current position.
- 3 Do one of the following:
 - To create a grade, select an unused storage container.
 - To update a grade with modified settings, select the storage container of the grade you want to update.



(a) Used storage container (b) Unused storage container

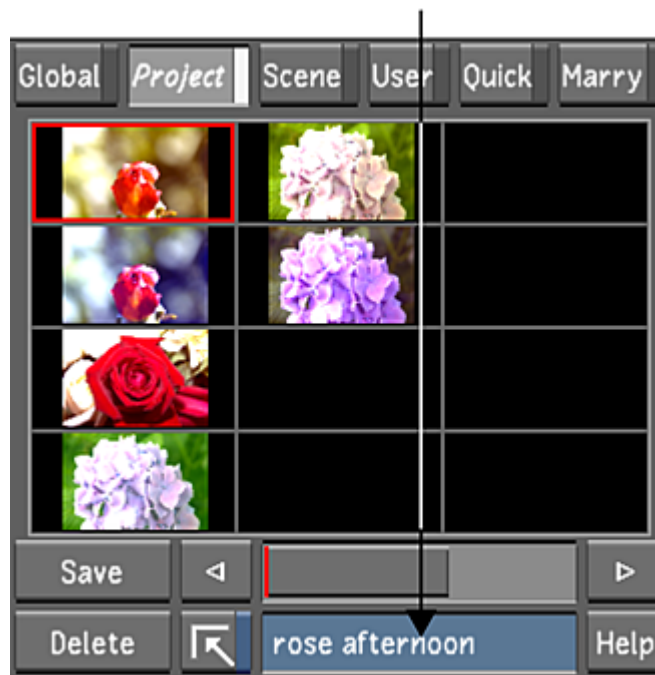
NOTE When you add a grade to a container in the last column of the Grade bin, three new columns are automatically added to the right. You can add an unlimited number of grades.

- 4 Click Save.

The settings from the current shot in the timeline are saved to the Grade Bin and a thumbnail of the current frame appears in the Grade bin.

TIP You can use the thumbnail as a reference image while you work on another shot. See [Viewing Reference Images](#) (page 317).

- 5 (Optional) Enter a name or comment in the Note field and press `Enter`.



To save grading information from several shots to the Grade bin:

- 1 Do one of the following:
 - To choose grades for specific shots, use the Storyboard or the Multi-Layer Timeline to select the shots whose grading information you wish to save to the Grade bin. For more information about selecting elements in the Multi-Layer Timeline, refer to [Selecting Elements](#) (page 283).
 - To choose all shots in the timeline, leave all shots unselected.
- 2 In the Grade bin, select the storage container where you wish to save your grade.
- 3 Hold down the **Shift** key while pressing the Save button.

WARNING Storage containers with existing grading information will be overwritten. If you are saving to storage containers that already have grading information, Lustre prompts you to confirm you want to overwrite these grades.

- 4 If you are saving to storage containers that already have grading information, confirm or cancel the action when Lustre prompts you to confirm the action.

The selected grades are saved to the Grade bin.

Applying Grades to Shots

Grade bins:applying grades;applying grades;shots:applying gradesYou can apply grades to one or multiple shots in the Storyboard or timeline. Apply intermediary grades to your shots when you want to experiment with different looks. You can control which saved settings you want to apply—all the settings from the intermediary grade, only those selected in the Selector, or only those in the current menu.

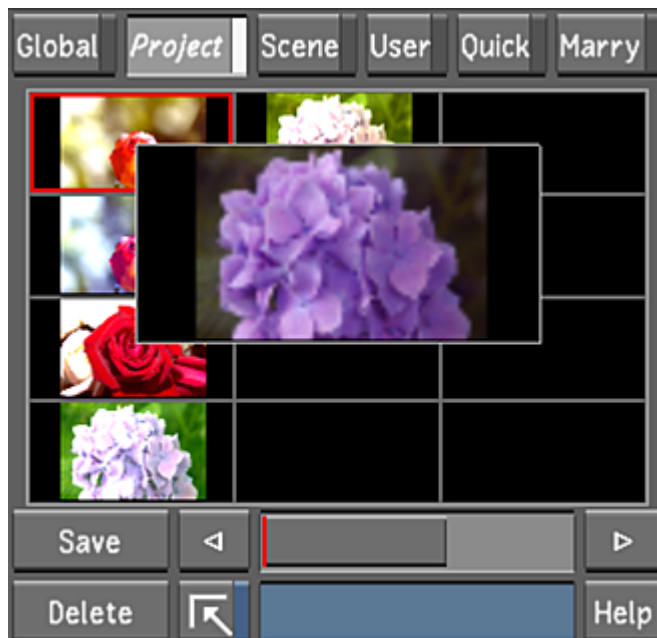
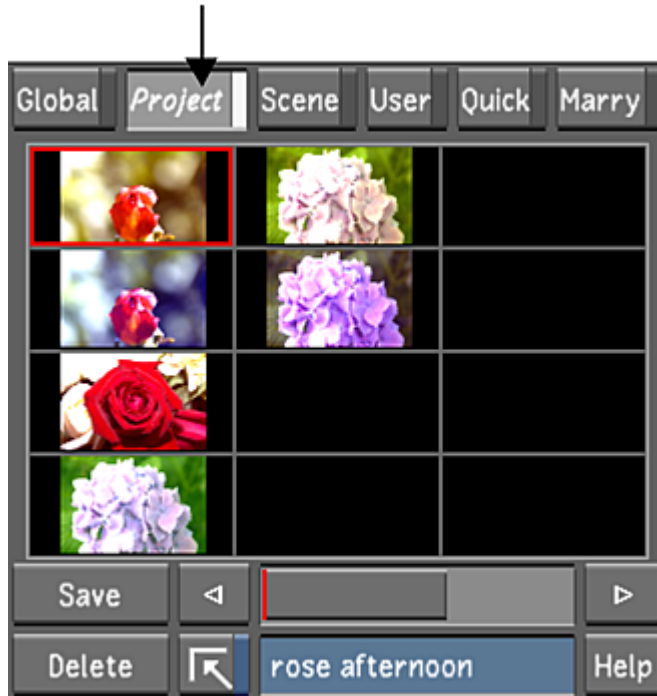
To load intermediary grades from a Grade bin:

- 1 In the Storyboard, select the shots to which you want to apply an intermediary grade.

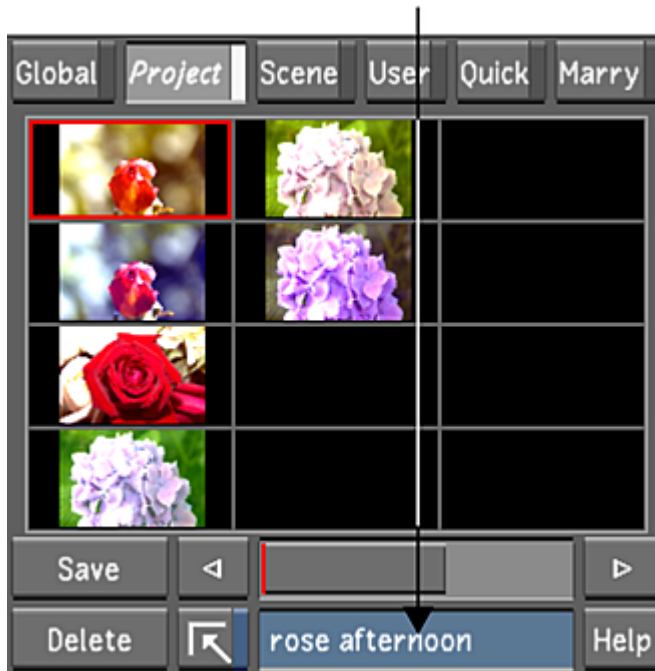
TIP You can select multiple shots by right-clicking them in the Storyboard. You can also create groups of shots. See [Selecting Shots in the Storyboard](#) (page 328) and [Creating Shot Groups](#) (page 141).

- 2 Select the Grade bin you want to use.

NOTE If you select the Marry Grade bin, each shot that you select will be loaded with the corresponding Marry grades for that specific shot. See [Using the Marry Grade Bin](#) (page 151).



TIP To display an enlarged image of the thumbnail, place your mouse cursor over a thumbnail without clicking.



3 Do one of the following:

Double-click a shot's thumbnail

- To load all the settings in the grade to the current shot only.

TIP Double-click an unused storage container in the Grade bin to reset selected shots to their default settings.

Press Shift and double-click a shot's thumbnail

- To load all the settings in the grade to selected shots.

Press Ctrl and double-click a shot's thumbnail

- To load the grade settings to the current shot only from the current menu only. For example, if the Grading menu is displayed, the saved settings from the Grading menu are applied.

Press Ctrl+Shift and double-click a shot's thumbnail

- To load the grade settings to selected shots from the current menu only. For example, if the Grading menu is displayed, the saved settings from the Grading menu are applied.

Press Alt and double-click a shot's thumbnail

- To load the grade settings that are selected in the Selector to the current shot only. See [Copying Parameters with the Selector](#) (page 146).

Press Alt+Shift and double-click a shot's thumbnail

- To load the grade settings that are chosen in the Selector to a selection of shots. See [Copying Parameters with the Selector](#) (page 146).

The grade is applied. In the Player, the image is updated to reflect the current settings.

TIP To revert to the previous settings, click Undo.

Within the Storyboard view, you can drag and drop the grading from one shot to another. You can reapply the grading in one or more different shots without having to drop it in the Grade bin first.

To drag and drop the grade from one shot to another:

- 1 Do one of the following:
 - Hold down **Ctrl+Shift** and drag and drop to copy grades to multiple destinations.
 - Hold down **Ctrl+Alt** and drag and drop to use the Selector to copy grades to a single destination.
 - Hold down **Ctrl+Shift+Alt** and drag and drop to use the Selector to copy grades to multiple destinations.

Moving Grades

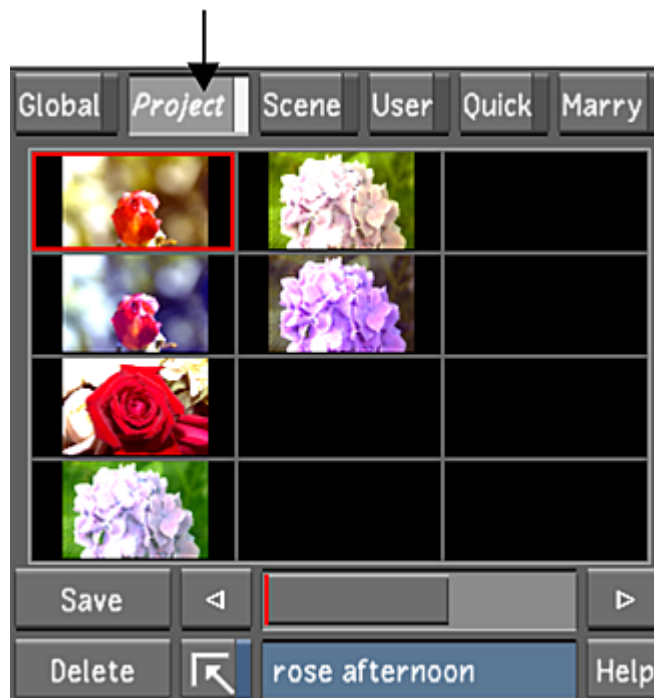
You can reorganize the Grade bin by moving grades from one storage container to another. You can also drag a Grade bin to the file browser or expanded Grade bin in the Grade view. See [Moving Grade Files Between Grade Bins](#) (page 167).

Deleting Grades

Grade bins: deleting grades; deleting: grades, from Grade bin You can delete grades one at a time, or delete all grades from the Grade bin simultaneously.

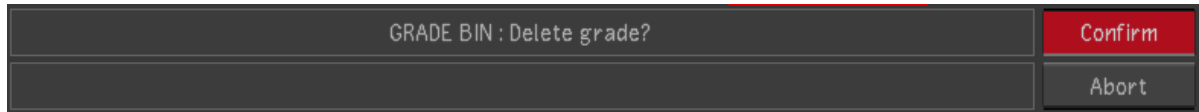
To delete grades from a Grade bin one at a time:

- 1 Select the Grade bin from which you want to delete grades. The name of the selected thumbnail appears in the Note field.



- 2 The Message Bar will show a message asking you to confirm or cancel the action and a red Confirm button along with a grey Abort button will appear to the right of the Message Bar. Click the appropriate button to confirm or abort the action.

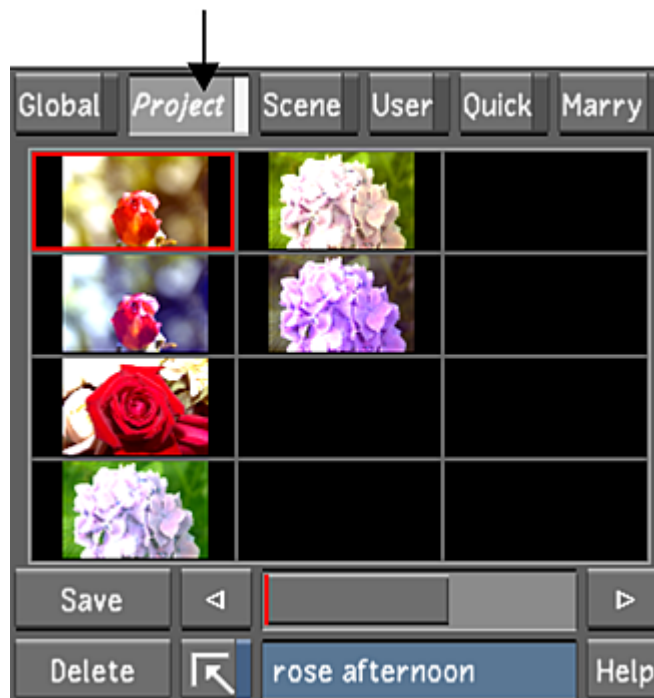
NOTE The Message Bar is exclusive to Lustre 2012 Extension 1. In prior versions of Lustre, there is simply a Confirm button.



You can delete saved grades from the Grade Bin without needing to confirm, by using the Ctrl+Delete keyboard shortcut.

To delete all grades from the Grade bin simultaneously:

- 1 Select the Grade bin from which you want to delete grades.



- 2 Hold down *Shift* while clicking Delete.
The Message Bar will show a message asking you to confirm or cancel the action and a red Confirm button along with a grey Abort button will appear to the right of the Message Bar. Click the appropriate button to confirm or abort the action.

NOTE The Message Bar is exclusive to Lustre 2012 Extension 1. In prior versions of Lustre, there is simply a Confirm button.

Using the Expanded Grade Bin

Use the expanded Grade bin to locate and display grade files. You can manage intermediary grade files at the global, project, scene, or user level, and Marry grade files at the shot-based level. You can also define a custom folder and bookmark it for quick access.

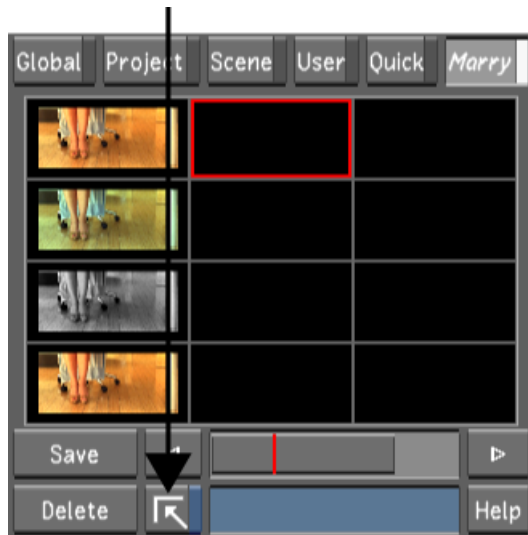
In addition to move, copy, and delete operations, you can create new folders, enable a player to view grades and shots, and work in different views to view grade files.

Accessing the File Browser

Grade view:displaying;file browser:in Grade viewUse the file browser to locate grade data and load it into the Grade bin.

To access the file browser:

- 1 In the Grade bin, click the Expand button.



Footage courtesy of EVN PRODUCTIONS

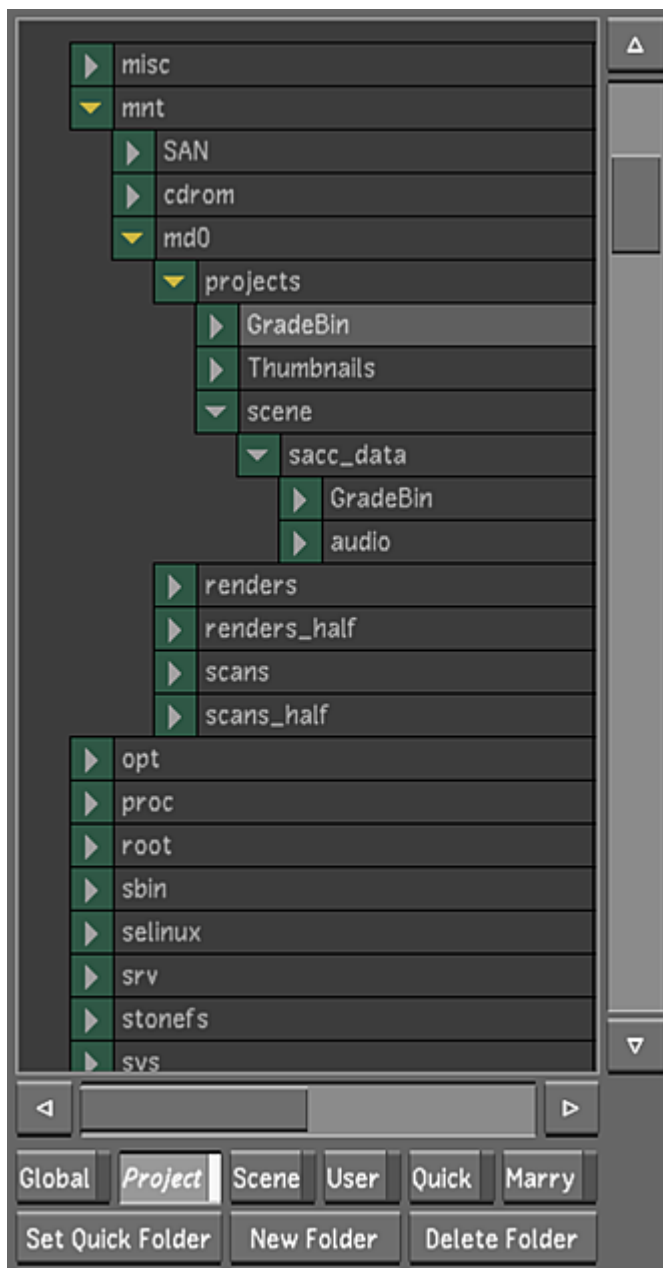
The Grade view appears.



Image courtesy of EVN PRODUCTIONS (a) File browser (b) Expanded Grade bin (c) Player

When you are in the Grade view, the work area is divided into multiple areas.

File browser Use to locate grade data and display it in the expanded Grade bin.



Click:	To:
Global	Display the location of the global Grade bin folder and its contents.
Project	Display the location of the project Grade bin folder and its contents.
Scene	Display the location of the scene Grade bin folder and its contents.
User	Display the location of the user Grade bin folder and its contents.
Quick	Display the location of the folder selected with the Set Quick Folder option.

Click:	To:
Marry	Display the location of a Marry Grade bin folder and its contents. See Using the Marry Grade Bin (page 151).
Set Quick Folder	Set the currently selected folder in the File Browser as the Quick Folder.
New Folder	Create a new folder under the currently selected folder. Enter a new name. Rename the folder at any time by right-clicking it and entering a new name (the global, scene, project, and user directories, cannot be renamed).
Delete Folder	Delete the currently selected folder (for which you have deletion permissions enabled). The Message Bar will show a message asking you to confirm or cancel the action and a red Confirm button along with a grey Abort button will appear to the right of the Message Bar. Click the appropriate button to confirm or abort the action. NOTE The Message Bar is exclusive to Lustre 2012 Extension 1. In prior versions of Lustre, there is simply a Confirm button.

TIP Place the cursor over the file browser or expanded Grade bin, and press `Shift++` to cycle through the display of different expanded Grade bins.

Expanded Grade bin Use to display and organize the grade files.



0

Name : 0
Note :
Project : Hatched_Project
Grade :
Created by : Marc
Scene : default
Saved on Nov 03 2011 (15:19:36)

Cut : HATCHED_cabinet_VFX (00:00)
Shot Uid : 22141387990368573
Shot Name : HATCHED_cabinet_VFX
Reel Name : MODULE
Workstation : oshawa



1

Name : 1
Note :
Project : Hatched_Project
Grade :
Created by : Marc
Scene : default
Saved on Nov 03 2011 (15:19:46)

Cut : HATCHED_cabinet_VFX (00:00)
Shot Uid : 22141387990368573
Shot Name : HATCHED_cabinet_VFX
Reel Name : MODULE
Workstation : oshawa



2

Name : 2
Note :
Project : Hatched_Project
Grade :
Created by : Marc
Scene : default
Saved on Nov 03 2011 (15:19:55)

Cut : HATCHED_cabinet_VFX (00:00)
Shot Uid : 22141387990368573
Shot Name : HATCHED_cabinet_VFX
Reel Name : MODULE
Workstation : oshawa



3

Name : 3
Note :
Project : Hatched_Project
Grade :
Created by : Marc
Scene : default
Saved on Nov 03 2011 (15:20:38)

Cut : HATCHED_cabinet_VFX (00:00)
Shot Uid : 22141387990368573
Shot Name : HATCHED_cabinet_VFX
Reel Name : MODULE
Workstation : oshawa



Name : 4
Note :
Project : Hatched_Project
Grade :

Cut : HATCHED_cabinet_VFX (00:00)
Shot Uid : 22151447776854216
Shot Name : HATCHED_50s_source
Reel Name : IMPORT

<

>

Details

Proxies

List

Delete Selected

Player

Select All

Unselect All

Refresh

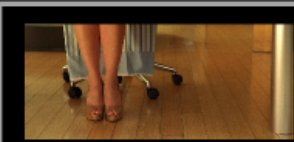
Delete All

Footage courtesy of EVN PRODUCTIONS

Click:	To:
Details	Display grade files in Thumbnail and Text view.
Proxies	Display grade files in Thumbnail view.
List	Display grade files in Text view.
Player	Display the contents of the expanded Grade bin and the Player. Disable button to display the expanded Grade bin only. Press Q to alternate the display between a large Storyboard view and the Player.

Click:	To:
Select All	Select all grade files in the expanded Grade bin.
Unselect All	Deselect the selected grade files in the expanded Grade bin.
Refresh	Rescan the file systems and update the file browser and expanded Grade bin with up-to-date information.
Delete Selected	Delete selected grade files.
Delete All	Delete all grade files from the expanded Grade bin. The Message Bar will show a message asking you to confirm or cancel the action and a red Confirm button along with a grey Abort button will appear to the right of the Message Bar. Click the appropriate button to confirm or abort the action. NOTE The Message Bar is exclusive to Lustre 2012 Extension 1. In prior versions of Lustre, there is simply a Confirm button.
Player	Show/hide a player in the Grade view.

Details

	Name : 0 Note : Project : Hatched_Project Grade : Created by : Marc Scene : default Saved on Nov 03 2011 (15:19:36)	Cut : HATCHED_cabinet_VFX (00:00:00:00) Shot Uid : 22141387990368573 Shot Name : HATCHED_cabinet_VFX Reel Name : MODULE Workstation : oshawa
	Name : 1 Note : Project : Hatched_Project Grade : Created by : Marc Scene : default Saved on Nov 03 2011 (15:19:46)	Cut : HATCHED_cabinet_VFX (00:00:00:00) Shot Uid : 22141387990368573 Shot Name : HATCHED_cabinet_VFX Reel Name : MODULE Workstation : oshawa
	Name : 2 Note : Project : Hatched_Project Grade : Created by : Marc Scene : default Saved on Nov 03 2011 (15:19:55)	Cut : HATCHED_cabinet_VFX (00:00:00:00) Shot Uid : 22141387990368573 Shot Name : HATCHED_cabinet_VFX Reel Name : MODULE Workstation : oshawa
	Name : 3 Note : Project : Hatched_Project Grade : Created by : Marc Scene : default Saved on Nov 03 2011 (15:20:38)	Cut : HATCHED_cabinet_VFX (00:00:00:00) Shot Uid : 22141387990368573 Shot Name : HATCHED_cabinet_VFX Reel Name : MODULE Workstation : oshawa
	Name : 4 Note : Project : Hatched_Project Grade :	Cut : HATCHED_cabinet_VFX (00:00:00:00) Shot Uid : 22151447776854216 Shot Name : HATCHED_50s_source Reel Name : IMPORT

Proxies



List

Name	Note	Project	Grade	Created by	Scene	Saved On	Cut	Shot Uid	Shot Name	Reel Name
0		Hatched_Project		Marc	default	Nov 03 2011 (15:19:36)	HATCHED_cabin	22141387990368573	HATCHED_cabin	MODULE
1		Hatched_Project		Marc	default	Nov 03 2011 (15:19:46)	HATCHED_cabin	22141387990368573	HATCHED_cabin	MODULE
2		Hatched_Project		Marc	default	Nov 03 2011 (15:19:55)	HATCHED_cabin	22141387990368573	HATCHED_cabin	MODULE
3		Hatched_Project		Marc	default	Nov 03 2011 (15:20:38)	HATCHED_cabin	22141387990368573	HATCHED_cabin	MODULE
4		Hatched_Project		Marc	default	Nov 03 2011 (15:24:43)	HATCHED_cabin	22151447776854216	HATCHED_50s	IMPORT
5		Hatched_Project		Marc	default	Nov 03 2011 (15:24:54)	HATCHED_cabin	22151447776854216	HATCHED_50s	IMPORT

Footage courtesy of EVN PRODUCTIONS

Player Use to display selected shots and grade files.



Footage courtesy of EVN PRODUCTIONS

Click:	To:
Grade	Display the current grade selected in the expanded Grade bin.
Timeline	Display the current shot selected in the Timeline or Storyboard.

NOTE When in Timeline mode, the Player displays the shot from the timeline with its current grade applied to it, which is not necessarily the grade selected in the Expanded Grade Bin.

Defining the Quick Folder

Grade view:Quick folder;Quick folder:definingYou can use the file browser to select any folder and define it as a location in which you want to store grade files. Once you have stored the location of this folder, you can quickly display and select it in the file browser, and use the Quick buttons to display its contents in the Grade bin and expanded Grade bin.

To set the Quick folder:

- 1 Navigate to the folder you want to set as your Quick folder.
- 2 Click the name of the folder to select it.
- 3 Click Set Quick Folder.

Loading Grade Files from the Expanded Grade Bin

Grade view:loading from;grades:loading from Grade viewOnce you locate your Grade bin folder in the file browser and display its contents in the expanded Grade bin, you can move grade files into the Grade bin storage containers. Grade files in the expanded Grade bin are pointers to the actual files on the file system. You can view information about the grade files in expanded Grade bin.

Moving Grade Files Between Grade Bins

Grade view:moving filesIn addition to moving grade files from the expanded Grade bin to a storage container, you can use drag-and-drop operations to move and copy between the expanded Grade bin, Grade bin storage containers, and file browser.

NOTE To copy a grade file from one location to another, hold down `Ctrl` as you drag files from the source Grade bin to its destination.

Drag from:	Drop in:
Expanded Grade bin	■ A folder in the file browser ■ A Grade bin storage container
Grade bin storage container	■ Another Grade bin storage container ■ An expanded Grade bin ■ A folder in the file browser
File browser	Illegal operation: Using a drag-and-drop operation, the file browser can only have a grade file moved or copied to it.

Applying Grade Files to Shots in a Cut

Grade view:applying grade to shotsYou can select grade files in the expanded Grade bin and apply them to a shot in the Storyboard or Timeline.

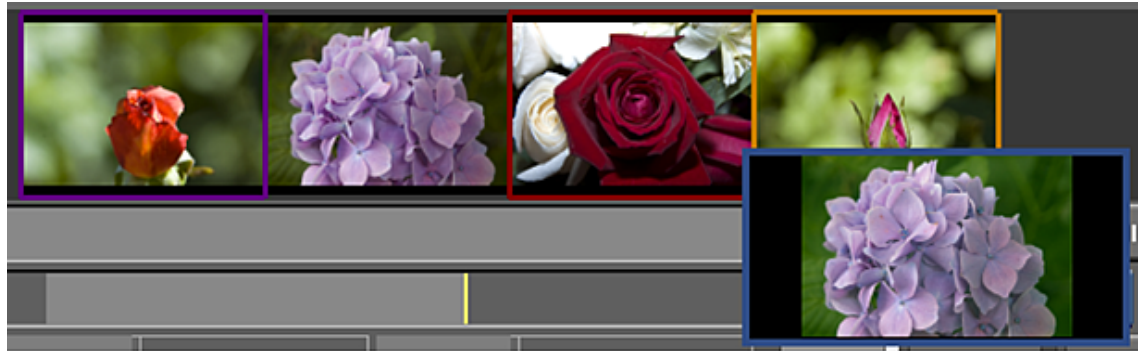
To apply grade files from the expanded Grade bin to a shot:

- 1 Do one of the following:
 - In the Proxies or Details view, click the grade file.
 - In the List view, click the grade name.

The cursor picks up the grade file. If you click more than one grade file, only the first grade file will be applied.

- 2 Move the cursor to the Storyboard or Timeline.

If the shot is moved to the Storyboard, an orange highlight appears around the selected shot.



- 3 Click to drop the grade file on the shot.

TIP Double-click an unused storage container in the Grade bin to reset selected shots to their default settings.

Deleting Grades From the Expanded Grade Bin

Grade view:deleting gradesYou can delete all or selected grade files from the expanded Grade bin.

NOTE Deleting grade files from the expanded Grade bin does not delete grade data from the Storyboard.

To delete selected grade files from the expanded Grade bin:

- 1 Select the grade files you want to delete.
- 2 Click Delete Selected, and then confirm the action.

All the selected grade files are deleted.

To delete all grade files from the expanded Grade bin:

- 1 Click Delete All.
- 2 The Message Bar will show a message asking you to confirm or cancel the action and a red Confirm button and a grey Abort button will appear to the right of the Message Bar. Click the appropriate button to commence or cancel the action.

All the grade files are deleted.

Grading Presets

From the Grade Bin's Global folder, you can access various grading presets that provide different looks you can use as a starting point for your grades.

The grading presets are organized into seven categories:

- **Color Filters:** 15 color filters, such as Color Temperature Blue, Color Temperature Orange, Cool, Warm, Sepia, etc.
- **Diffusion Filters:** 21 diffusion filters, such as Center Focus, Diffusion, Blur, Fog, etc.
- **Film:** 24 presets emulating film lab processing and film stock, such as xProcess, Bleach Bypass, 2 Strips, 3 Strips, Very Old Film, etc.
- **Grad Filters:** 8 gradient filters, such as Blur, Green, Red, Amber, etc.
- **Image:** 28 image manipulation presets, such as Flip, Flip, Flip/Flop, Sharpen, Negative, Overexposed, Noise, etc.
- **Looks:** 38 look types, such as Day For Night, Film Noir, Expressionism, 8mm, Atomic Blast, etc.
- **Vignette:** 16 circle and rectangle vignettes with various highlight and blur values.

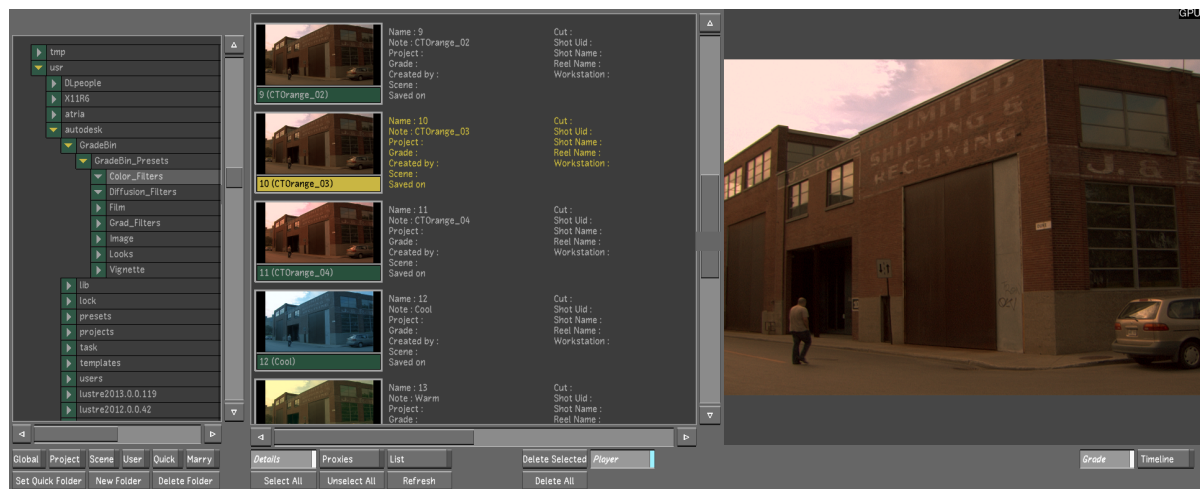
For the complete list of grading presets, see [Grading Presets List](#) (page 170).

Accessing the Grading Presets

The grading presets are located in the Global Grade Bin folder, in a sub-folder named GradeBin_Presets.

To access the grading presets:

- 1 Navigate to the Global Grade Bin folder with the Expanded Grade Bin and expand the GradeBin_Presets folder to see the different preset categories, listed above.
- 2 Select a preset folder to see a thumbnail representation of the preset in the Expanded Grade Bin.
- 3 Double-click on the name of a preset thumbnail to see the preset in the Expanded Grade Bin Player.



TIP You can also preview the selected preset on the currently selected shot in the storyboard by selecting Timeline rather than Grade in the Expanded Grade Bin Player.

Using the Grading Presets

To use the grading presets, first copy them to either the Global, Project, Scene or User Grade Bin.

To copy grading presets to the Grade Bin:

- 1 Hold the Ctrl key on the keyboard.
- 2 Select one or more grading presets from the Expanded Grade Bin.
- 3 Drag & drop the grading presets to the Grade Bin of your choice (Global, Project, Scene, User).

The selected grading presets are now displayed in the Grade Bin.

To apply a grading preset to a shot:

- 1 Select the shot you want to apply the grading preset to in the Storyboard.
- 2 Double-click on the grading preset in the Grade Bin.

The grading preset is applied to the selected shot.

To edit a preset:

- 1 Apply the grading preset to the selected shot.
- 2 Modify the parameters.
- 3 Press the Save button at the bottom left of the Grade Bin, if you want to save the modified preset.

NOTE You can also load the entire contents of a Grade Bin Presets sub folder (Color_Filters, Diffusion_Filters, Film, etc.) by assigning it as a Grade Bin Quick Folder. However, this creates a symbolic link from the Grade Bin to the location of the grading presets. It does not copy them. This means that if you modify and save a modified grading preset, you are overwriting the original.

See [Accessing the File Browser](#) (page 159).

See [Applying Grades to Shots](#) (page 154).

Grading Presets List

The following tables list the complete grading presets available in Lustre. Some presets include multiple variations.

Color Filter Presets:	Description:
Clear	Resets the grading parameters.
CTBlue (01 to 04)	Color temperature presets that attempt to fix white balance issues (tungsten to daylight).
CTOrange (01 to 04)	Color temperature presets that attempt to fix white balance issues (daylight to tungsten).
Cool	Blue/green overall cast.
Warm	Yellow/orange overall cast.
Sepia	Soft brownish cast.
Blue	Soft blue cast.

Color Filter Presets:	Description:
Solar_Flare	Strong orange cast.
Neo	Greenish overall cast.
Purple	Soft purple cast.
Diffusion Filter Presets:	Description:
Clear	Resets the grading parameters.
Center_Focus (01 to 04)	Variations of a Circle shape with blur on the outside of the mask.
Diffusion_Filter_Blur	Soft blurry highlights.
Black_Diffusion	Soft blurry shadows.
Black_Diffusion_Mist	Heavy blurry shadows.
Diffusion_Glamour	Sublte diffusion preset.
Fog (01 to 04)	Variations of overall fog.
Blur (01 to 04)	Variations of blur.
High_Diffusion (01 to 04)	Variations of blurry highlights.
Heavy_Diffusion	Heavy highlights diffusion.
Film Presets:	Description:
Clear	Resets the grading parameters.
xProcess (01 to 04)	Four variation of cross processing photographic effect.
Bleach_Bypass	Bleach bypass color processing looks.
2_Strips	Emulation of the 2 strips color process.
3_Strips	Emulation of the 3 strips color process.
Kchrome	Film stock looks.
Red_Scale_100	Emulation of photographic processes involving exposing the back side of color negative.

Film Presets:	Description:
Echrome	Film stock looks.
Infrared	Black and white film stock look.
Night_Vision_Blue	Overall blue cast.
Very_Old_Film	Light black and white look with heavy grain.
BW_Aged	Old film with a yellow, green and blue cast.
BW_HighCon	High contrast black and white looks.
Gradient Filters Presets:	Description:
Clear	Resets the grading parameters.
Grad_Blue	Gradient shape with a dipping blue cast at the top of the image.
Grad_Blue_Green	Gradient shape with a dipping blue cast at the top of the image and a green cast at the bottom.
Grad_Amber_Green	Gradient shape with a dipping amber cast at the top of the image and a green cast at the bottom.
Grad_Amber_Purple	Gradient shape with a dipping amber cast at the top of the image and a purple cast at the bottom.
Grad_Red	Gradient shape with a dipping red cast at the top of the image.
Grad_Green	Gradient shape with a dipping green cast at the top of the image.
Grad_Sunset	Gradient shape with a dipping orange cast at the top of the image.
Grad_Sunrise	Gradient shape with a dipping purple cast at the top of the image.
Image Presets:	Description:
Clear	Resets the grading parameters.
Flip	Image is vertically inverted.
Flop	Image is horizontally inverted.
Flip_Flop	Image is both vertically and horizontally inverted.

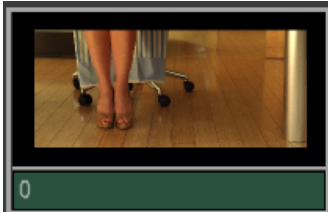
Image Presets:	Description:
Sharpen (01 to 04)	Variations of image sharpening.
Anamorphic	Converts anamorphic images to square pixels.
Color_Negative	Color film negative look.
BW_Negative	Black and white film negative look.
Negative_Masked	Exposed color film negative look.
Vertical_Blur	Vertical blurring.
Horizontal_Blur	Horizontal blurring.
Photocopy	Variations of photocopy looks (color and black and white).
Overexposed	Variations of overexposed looks.
Noise	Variations of black and white looks with noise.
Moon	Moon in the sky created with shapes.
Stars	Stars in the sky created with shapes.
Moon_and_Stars	Moon and stars in the sky created with shapes.
Moon_Stars_and_Clouds	Moon, stars and clouds in the sky created with shapes.
Looks Presets:	Description:
Clear	Resets the grading parameters.
Day_For_Night	Converts a day scene to a night scene.
Film_Noir	1950s drama look.
Expressionism	1960s drama look.
Matrix	Postmodern drama look.
Sixties_slides	Reversal slides look.
Berlin	1970s drama look.
Black_and_White	Black and white realistic look.

Looks Presets:	Description:
BW_Newspaper	Black and white look with grain.
8mm	Projected film stock look.
Drama	Variations of dramatic cold and warm looks.
Dusk	Bluish drama look.
Vivid	Variations of a realistic look.
Murky_Old_Negative	Dramatic low contrast brown cast.
Atomic_Blast	Science fiction dramatic look.
Faded	Variations of a faded look.
Glowy	Pale bluish look.
Glowy_Warm	Pale yellowish look.
Low_Contrast	Low contract look.
Purple_Smear	Purple cast with blurry vertical lines.
Ultraviolet_Flare	Purple cast with blur.
Cool_Darker	Dramatic dark look.
Bright_Yellow_Glow	Hard orange cast.
Pinkish	Pink cast.
Gold	Heavy gold look.
Streaks	Overexposed color flares look.
Warm_Sky	Orange cast sky.
Cool_Thriller	Bluish dramatic look.
Warm_And_Soft	Warm blurry look.
End_Of_Day	Warm and dark overall look.
Reddish	Dark and blurry red look.

Looks Presets:	Description:
Early_Morning	High contrast red and blurry look.
Vignette Presets:	Description:
Clear	Resets the grading parameters.
Vignette_Circle	Variations of circle vignettes with blur and highlights / shadows look
Vignette_Rectangle	Variations of rectangle vignettes with blur and highlights / shadows look.

Viewing Media File Information

Grade view: viewing media file information When you view grade files in the expanded Grade bin, you can display information about the media files.



Name : 0

Note :

Project : Hatched_Project

Grade :

Created by : Marc

Scene : default

Saved on Nov 03 2011 (15:19:36)

Cut : HATCHED_cabinet_VFX (00:00:00:00)

Shot Uid : 22141387990368573

Shot Name : HATCHED_cabinet_VFX

Reel Name : MODULE

Workstation : oshawa

Details view

Name	Note	Project	Grade	Created by
0	rose afternoon	tamu_2010	default	Tamu
1	rose daytime	tamu_2010	default	Tamu
2	rose morning	tamu_2010	default	Tamu
3	butterfly black morning	tamu_2010	default	Tamu
4	stripe butterfly dusk	tamu_2010	default	Tamu
5	stripe butterfly day	tamu_2010	default	Tamu

Footage courtesy of EVN PRODUCTIONS List view

NOTE Text information is not displayed in Thumbnail view.

Name Displays the name of the grade file.

Note Displays any notes saved with the grade. Right-click to edit the note.

Project Indicates the project in which the grade was created.

Grade Indicates the original grade in which the grade file was created.

Created by Indicates the user that created the grade.

Scene Indicates the original scene in which the grade was created.

Saved on Displays the date on which the grade was saved.

Cut Indicates the original cut in which the grade was created.

Shot UID Displays the shot's unique ID.

Shot Name Displays the name of the shot saved with the grade.

Reel Name Displays the name of the source reel on which the shot is saved.

Workstation Displays the workstation on which the grade was created.

To sort List view information:

- 1 Do one of the following:
 - Click a column header to sort the list in ascending order by selected column. Re-click the column to sort the list in descending order.
 - Press **Ctrl** and click any column header to reset the sort order by name.

Loading Grading Presets

presets:saving and loading for grading;Grade view:loading presetsYou can select which grading information you load from a grade file in the expanded Grade bin or the Grade bin using preset lists.

See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

Using Audio

audio:importing and offsettingYou can hear audio during timeline playback if you import or capture a WAV or AIFF file into the system. The imported/captured file is associated with a cut and begins playback at the same time as the timeline. You can also hear audio during timeline playback if your system is using an external device which detects timecode. When you have selected an audio file or audio tracks to playback with your timeline, all the information (i.e., playback status, selected audio file or audio track, offset, LTC Chase option, and Sync option) are saved in the *Context* file.

NOTE Only one audio file can be associated with the timeline.

For more information on importing/capturing, playing back, and playing out audio, see [Audio](#) (page 683).

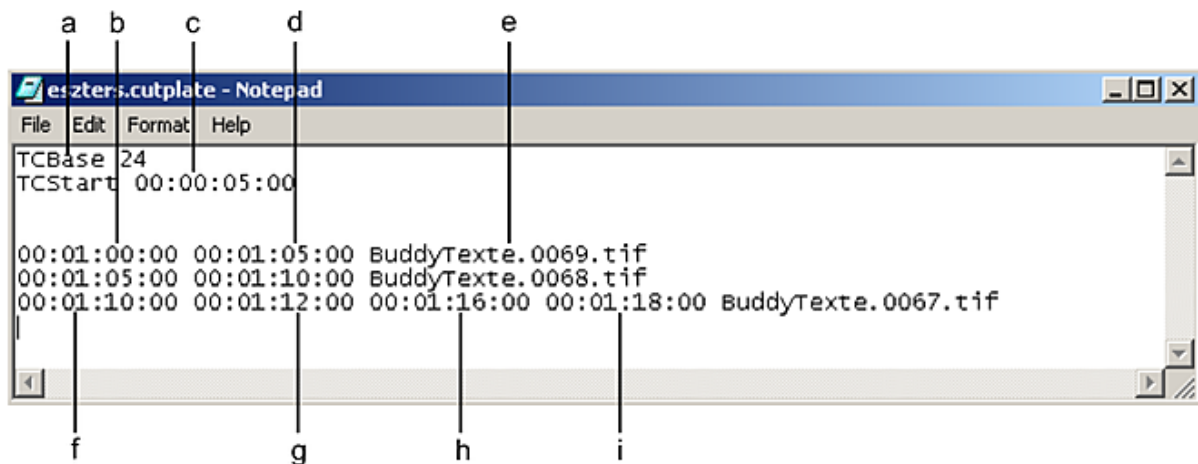
Using Text

credits, adding to the timelineWhen you want to add credits to a cut loaded to the timeline, you can automatically key text files containing an alpha channel over shots in the timeline. To do so, use a text plate EDL that describes how the text files are arranged in the timeline.

To use a text plate with a cut, the text plate file must use a *.cutplate* extension, as well as have the same filename as the *.cut* file you are using. For example, a text plate for *movie.cut* would be named *movie.cutplate*. Store the cut plate for the text files in the *Library* directory—where the loaded cut file is stored. Store the text files in the same scene's *Library\plate* directory.

NOTE If using the Linux version of Lustre, the above filename will use forward slashes.

The following is an example of a text plate EDL.



(a) TCBASE (frame rate) (b) Record in timecode (c) TCSTART (timecode offset) (d) Record out timecode (e) Text file name (f) Record in timecode and start of fade-in (g) Fade-in end timecode (h) Fade-out start timecode (i) Record out timecode and end of fade-out

The text plate EDL contains the following timecode information.

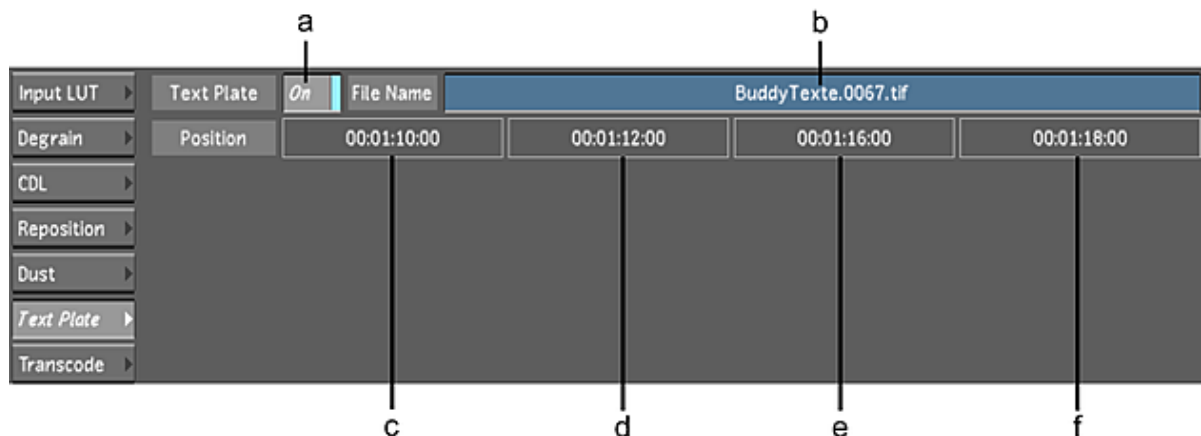
TCBASE Set the frame rate. You can set the frame rate to any rate, such as 24, 25, or 30 fps.

TCSTART Offset the timecode to slip the entire timeline. For example, 00:00:05:00 would slip the text plate 5 seconds earlier in the timeline.

MaxColor Set the colour intensity from 0-1023, where 0 is black and 1023 is white. If this value does not appear in the EDL, the value defaults to 800.

Timecode List the record timecode for each referenced text file. Set the record in timecode and record out timecode, as well as durations for fade-ins and fade-outs.

Use the Text Plate menu to turn text plates on or off.



(a) On/Off button (b) Text file name (c) Record in timecode and start of fade-in (d) Fade-in end timecode (e) Fade-out start timecode (f) Record out timecode and end of fade-out

To turn a text plate on:

- 1 Load the cut file with the text plate to the timeline. See [Managing Cuts](#) (page 101).
- 2 In the Image menu, click Text Plate.
The Text Plate menu appears.
- 3 In the timeline, go to the timecode where the text plate appears.
- 4 Set the On/Off button to On.

The Text plate is keyed over the shot in the Player. When the text plate is on, you can render the cut with the text plate.

To turn a text plate off:

- 1** In the Image menu, click Text Plate.
The Text Plate menu appears.
 - 2** In the timeline, go to the timecode where the text plate appears.
 - 3** Set the On/Off button to Off.
The text plate is turned off and no longer appears in the Player.
- NOTE** The On/Off button applies to all text plates in the timeline.

Calibration and Working Space

8

monitor calibrationAll monitors display colours differently. The colours that you see on your digital monitor change slightly over time because the back light degrades. This causes the maximum brightness of the monitor to decrease slightly. To ensure a perfect colour match between film and monitor, you need to calibrate the monitor. By regularly calibrating the monitor, you ensure that the image on the screen is consistent from day to day by creating a uniform environment—the basis for the accurate display of image colours.

WARNING When you set monitor calibration settings in the Setup > Calibrate menu, you override the monitor calibration settings already configured through User Management and Project Management. This override only survives for the session. After exiting Lustre and restarting the application, the monitor calibration settings will revert to the default settings configured in User and Project Management.

After you calibrate your monitor in Lustre, the image that you view is an accurate replica of that which is sent to the output buffer—with the monitor calibration Lookup Table (LUT) applied on top. If you output to a log file, you will need a log-to-display LUT. If you output to a linear file, you will need a linear-to-display LUT. The calibration design ensures that any modifications you make to the image are as accurately displayed as technically possible—thus reducing the chance of downstream errors.

You can calibrate the monitor automatically or manually. You can also select and compare up to three Print LUTs (either 1D or 3D) to calibrate your system display with the output from the printer. This nullifies the need for subsequent printer light adjustments.

NOTE You can have any number of Print LUTs on your system; however, you can only select three for quick comparisons.

However, with a 3D LUT, you amalgamate the different stages of calibration into the LUT including the calibration of the monitor and the application of the Print LUT measurements.

Logarithmic and Linear Colour Spaces

Logarithmic mode:monitor calibrationLogarithmic mode:monitor calibrationLogarithmic and Linear mode Lustre supports grading in a variety of colour spaces, including logarithmic and video colour spaces. The colour grading toolsets are dependant on whether the Grade Setup is in Logarithmic or Linear mode. In Log mode, the toolset is designed for digitized film images or digital cinema cameras working in a Logarithmic colour space. In Linear mode, the toolset is designed for video (that is, signals that you would send directly to a video monitor or digital cinema projector).

NOTE There has been considerable confusion in the industry over the term "linear". Historically, "linear" been used to refer to either video colour spaces or scene-linear colour spaces (that is, spaces that are radiometrically linear or based on scene exposure). In Lustre, the term "linear" refers to video-type colour spaces.

Lustre also supports grading of floating-point scene-linear colour spaces. In this case, the Float Conversion LUT in [Calibration Settings](#) (page 65) allows fine-tuning of the response of the grading controls. The Logarithmic grading toolset is best suited for grading scene-linear data. However, either toolset may be used with any colour space, so ultimately this is a colourist's choice.

Lustre offers a variety of tools for converting various inputs into a working colour space. The Image Input LUT panel allows applying traditional "Log-to-Lin" transforms and legacy 1d or 3d LUTs. The newer Image Transcode LUT Options panel (available for media imported via the Gateway) supports a wider selection of LUT formats and provides access to the Autodesk colour transform collection, including support for ACES input transforms.

See [Autodesk Colour Management](#) for more background information on choosing a working space and converting between colour spaces.

Using the ACESc and ACESct Colour Spaces

ACESc and ACESct are working colour spaces that is recommended for colour grading when using the Academy Color Encoding System. ACESc has a purely logarithmic encoding curve which allows very precise control over deep shadows but which can also be difficult to work with when not using the Log style grading tools. ACESct is a more recent working space that compresses shadows similar to familiar camera log curves and which may be easier to grade. If you need to apply an ASC CDL from an on-set ACESproxy workflow, then you should use ACESc as the working space. The following instructions are explained using ACESc, but the steps are essentially the same for ACESct.

- 1 In the Calibration settings of the Project Configuration settings, make sure that float_identity.fclut is selected as the Float Conversion LUT.
- 2 Import your OpenEXR media. You must do this using the Wiretap Gateway.

NOTE If you are accessing media that was imported to a Smoke or Flame system with the Cache Source Media option enabled, that media is no longer considered Gateway media. It is seen by Lustre as managed media and hence the LUT and Resize on import options are not available. To work around this, you can perform a Flush Cache Media operation in Smoke or Flame, prior to importing in Lustre.

- 3 Assuming that the clips are in the ACES2065-1 colour space, open the Image / Transcode / LUT Options menu, make sure that Colour Transform is selected under Conversion LUT Type, and look for ACES2065-1_to_ACESc in the Conversion LUT list.

If ACES2065-1_to_ACESc is not already available, you'll need to add it. To do this:

- 1 Click the Browse button (...).
- 2 Click the Bookmark field and select the **Autodesk** location.
- 3 Import interchange/ACESproxy/ACES2065-1_to_ACESc.ctf.

If the clips are not already in ACES2065-1 space, then you may go into Custom mode and first apply the Input Transform (IDT) to convert to ACES2065-1 before applying the working space transform.

- 4 For each clip, select ACES2065-1_to_ACESc in the Conversion LUT list and click Enable.
- 5 If you are using CDLs, make sure that Post Input LUT is selected on the Image / CDL menu.
- 6 On the Render / Output menu, select a custom transform that converts back to the ACES2065-1 colour space and then applies the ACES reference rendering transform (RRT) and output device transform (ODT) for your deliverables, and click Enable.

If you have not already defined an appropriate custom transform, you can do so as follows:

- 1 Make sure that Colour Transform is selected under Conversion LUT Type.
- 2 Click Custom.
- 3 Click Add.

- 4 Click Type and select Autodesk/interchange.
- 5 Click Transform and select ACESproxy/ACEScc_to_ACES2065-1.ctf.
- 6 Click Add again.
- 7 Click Type and select Autodesk/RRT+ODT.
- 8 Click Transform and select the appropriate transform for your output deliverable, such as ACES_to_P3-D60_1.0.ctf.

NOTE Currently both these transforms must be applied together. You may not move just the RRT+ODT part to Setup/Calibrate for an ACEScc workflow. This means that if you want to render out ACES2065-1 files, you will need to delete or mute (shift-M) the RRT+ODT transform before rendering.

Monitor Calibration Workflow

workflows:monitor calibrationmonitor calibration:workflowBecause different facilities may be set up differently, there are many monitor calibration scenarios, particularly if you are working with film images. The following workflow scenarios are guidelines for setting up the display environment that you need.

The recommended steps involved in setting up the proper display environment are as follows.

Step:	Refer to:
1. Adjust the black level and picture settings of the graphics monitor.	Adjusting Black Level and Picture Settings (page 181).
2. Select the colour space you intend to use for the project—logarithmic or linear.	Selecting the Project Colour Space (page 183).
3. If you are using a colourimeter, automatically calibrate the monitor.	Calibrating the Monitor Automatically (page 184).
4. If you do not have a colourimeter, manually calibrate the monitor.	Calibrating the Monitor Manually (page 187).
5. If your video card is set to Dual-Head mode, set LUTs for each monitor.	Calibrating for Dual-Head Mode (page 187).
6. Select and compare up to three Print LUTs obtained from your lab to determine which best calibrates the display with the printer.	Applying LUTs for Viewing (Print LUTs) (page 188).

NOTE Before you set up the proper display environment, make sure the graphics board is set to the supported resolution. See the *Autodesk Lustre Software Installation Guide* for your platform.

Adjusting Black Level and Picture Settings

picture settings, adjustingblack level:adjustingmonitor calibration:adjusting black level and picture settingsAll monitors come with controls to adjust brightness and contrast. Brightness affects the black level setting of the monitor; contrast controls the picture setting.

You should adjust these settings when you first unpack and connect the monitor. When you adjust the monitor, make sure lighting conditions in the room are what they usually are when you are working. Adjust brightness to set the black level first, and then adjust contrast to control the picture setting.

You should not have to change these settings provided you always use your system under consistent lighting conditions. These settings are perception-based, so do not worry about getting perfect results. In the end, you are trying to ensure that black looks black and white looks white.

Brightness (black level) offsets the red, green, and blue signals. Adjust the black level to display black as black without losing the distinction between black and very dark greys. Note the following:

- When the black level is too high, true black appears slightly grey.
- When the black level is too low, dark greys appear black, so you lose subtle details in shadows.

Contrast (picture setting) applies gain to the red, green, and blue signals. Adjust the picture setting to display white properly on the monitor. Note the following:

- If the picture setting is too low, white appears off-white on your display.
- If the picture setting is too high, very light grey is the brightest colour the monitor displays, so you lose subtle detail in highlights.

For more information about adjusting the black level and picture settings of your monitor, read Charles A. Poynton's monitor adjustment guide at:

http://www.poynton.com/notes/brightness_and_contrast/index.html

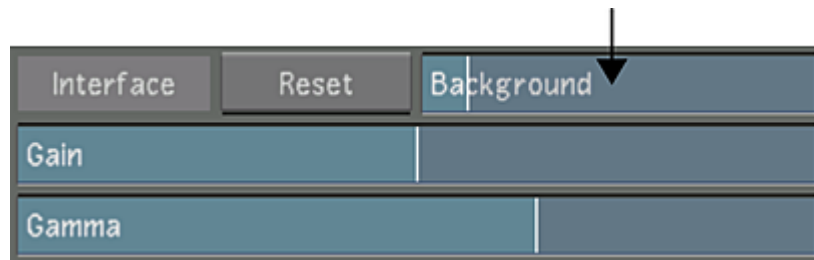
To adjust the black level setting:

- 1 Load a black frame (RGB 0, 0, 0) to the Storyboard. See [Creating a Cut with Shots in the Library](#) (page 214).

The black frame appears in the Player. Use this image to set your black level.

TIP You can also create a black frame (RGB 0, 0, 0) in the Curves menu by dragging the RGB curves down.

- 2 In the Main menu, click Setup, and then click Interface to display the Interface menu.
- 3 Set Background to the default value of 30.



A value of 30 creates a subtle contrast between the background colour and the black frame.

- 4 On the monitor, set Contrast to the minimum value.
- 5 On the monitor, set Brightness to the minimum value.
- 6 Slowly increase Brightness on the monitor to increase the black level. When the black image appears lighter than the surrounding background, stop increasing brightness and then decrease it a little. You should have a good black level value.

To adjust the picture setting:

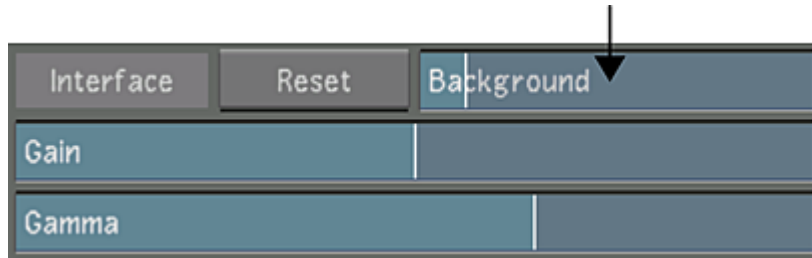
- 1 Adjust the black level as described in the previous procedure.

- 2 Load a white frame (RGB 1023, 1023, 1023 in Log mode) to the Storyboard. See [Creating a Cut with Shots in the Library](#) (page 214).

The white frame appears in the Player. Use this image to set your picture settings.

TIP You can also create a white frame (RGB 1023, 1023, 1023) in the Curves menu by dragging the RGB curves up.

- 3 In the Main menu, click Setup, and then click Interface to display the Interface menu.
- 4 Set Background to the default value of 30.



A value of 30 creates a good contrast between the background colour and the white frame.

- 5 On the monitor, set Contrast to the maximum value.
- 6 Slowly decrease Contrast on the monitor to adjust the picture setting. When you begin to see that the white frame turns light grey, stop decreasing contrast and then increase it a little.

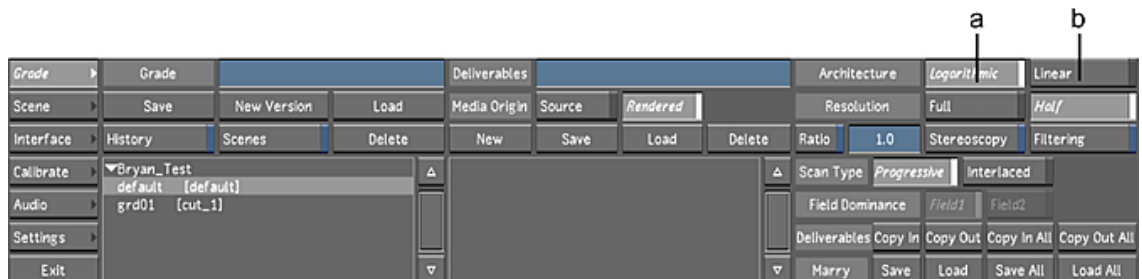
TIP If anything, err on the side of dark. Sensitivity to monitor flicker increases with the Contrast value. For the most part, the end result of monitor adjustment processes should be good blacks and whites on a screen you are comfortable looking at.

Selecting the Project Colour Space

colour space:setting for projectsmonitor calibration:selecting project colour spaceSelect the colour space that you intend to use for the project. The colour space should correspond to the footage you are using. If you are using film images, select logarithmic colour space. If you are using images with linear data (or you prefer the toolset), select linear.

To select the project colour space:

- 1 In the Main menu, click Setup, and then click Grade.
- The Grade menu appears.



(a) Logarithmic colour space button (b) Linear colour space button

- 2 Select a colour space:
 - Click Log to select the logarithmic colour space.
 - Click Linear to select the linear colour space.

Calibrating a Monitor

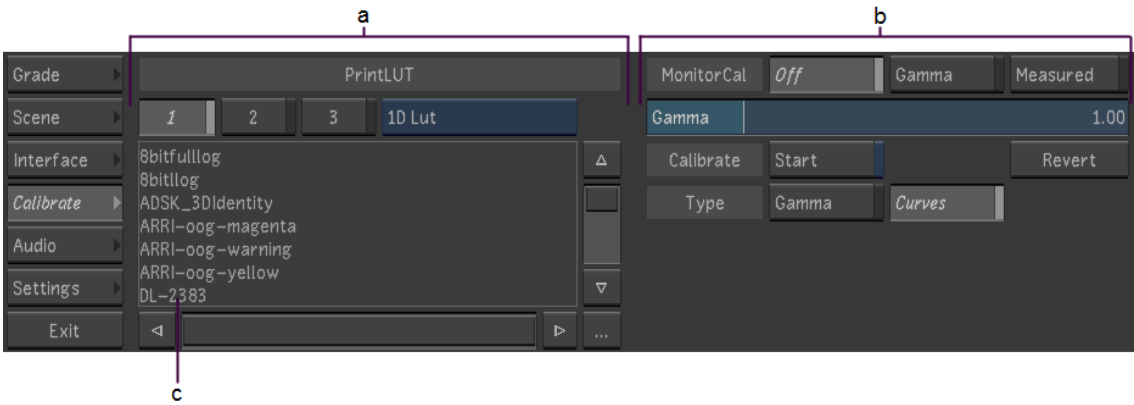
WARNING The built-in monitor calibration functions described in this section were intended for CRT monitors and are no longer relevant for modern displays. The feature is greyed out in Lustre 2017 and will be removed entirely in an upcoming version.

monitor calibration:calibratingIn Lustre, you can calibrate your monitor automatically or manually. Automatic monitor calibration is much more accurate than manual monitor calibration methods because manual methods hinge on perception, and your perception of the monitor can vary depending on the surrounding environment.

Access the Calibration tools in the Calibrate menu.

To access the Calibrate menu:

- 1 In the Main menu, click Setup, and then click Calibrate.
The Calibrate menu appears.



(a) Print LUT buttons (b) Calibration tools (c) Print LUT list

Calibrating the Monitor Automatically

colourimeter, calibrating a monitormonitor calibration:using a colourimeterUse a colourimeter (an external monitor measurement device) to scan your monitor's output and automatically correct the display.

You should automatically calibrate the monitor at the beginning of each project. If the project is long, you may want to recalibrate the monitor from time to time. Every 200 working hours is a good guideline.

To work with film, using a colourimeter is strongly recommended to get the best results.

Gamma Calibration

monitor calibration:gammagamma:measuring for monitor calibrationYou can calculate a gamma correction LUT using one measure. This creates a simple gamma curve.

To automatically calibrate the monitor based on a gamma measure:

- 1 In the Calibrate menu, click Off to disable existing monitor calibration settings.



- 2 Set the calibration type to Gamma.

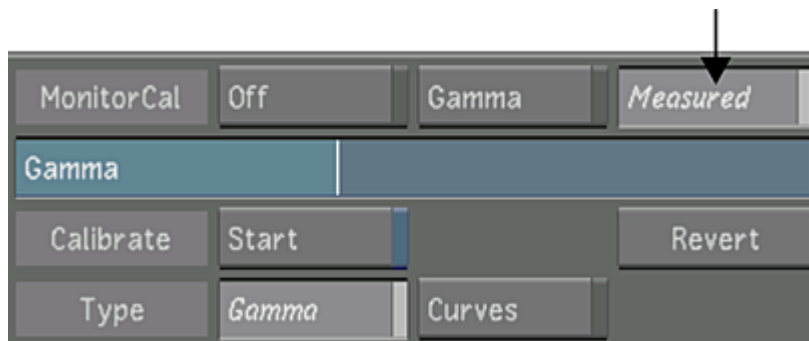


- 3 Attach the colourimeter to the centre of the screen.

- 4 Enable Start.

A series of grey patches appears on the screen. After a few moments, a monitor calibration LUT is generated based on the readings and saved to the *monitor.calib* file.

- 5 Click Measured to apply the monitor calibration settings.



Curves Calibration

monitor calibration:curvescurves:measuring for monitor calibrationYou can calculate the gamma correction LUT using a series of colours, which appears on the screen.

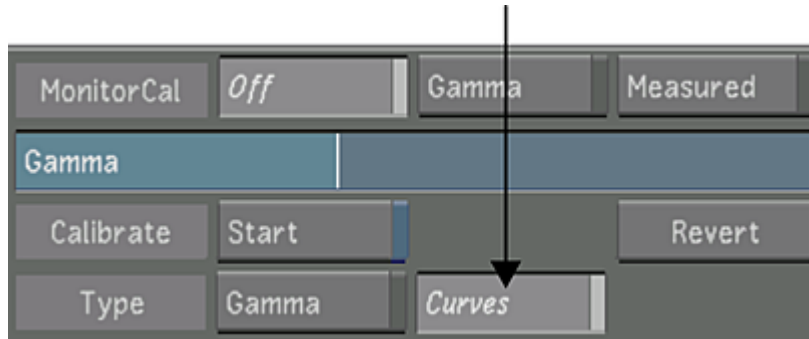
NOTE You can set the colour steps in the *init.config* file. See the *Autodesk Lustre Software Installation Guide*.

To automatically calibrate the monitor based on a curves measure:

- 1 In the Calibrate menu, click Off to disable existing monitor calibration settings.



- 2 Set the calibration type to Curves.



- 3 Attach the colourimeter to the centre of the screen.
- 4 Enable Start.
A series of colour patches appears on the screen. After a few moments, a monitor calibration LUT is generated based on the readings and saved to the *monitor.calib* file.
- 5 Click Measured to apply the monitor calibration settings.

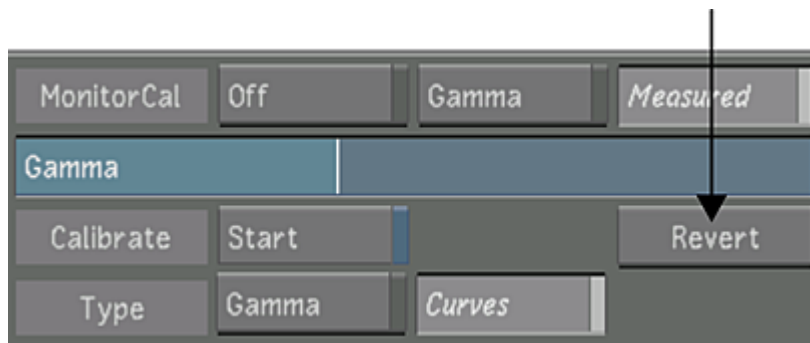


Reverting to a Previous Calibration Setting

monitor calibration:reverting to previous settingsreverting to previous, calibration settingsIf you are not satisfied with the results from the automatic calibration, you can revert to the previous automatic calibration.

To revert to a previous calibration setting:

- 1 In the Calibrate menu, click Revert.



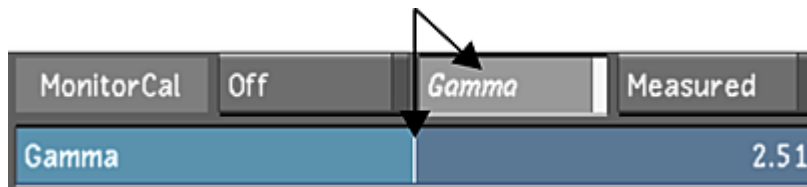
The LUT that was previously saved to the *monitor.calib* file is used to calibrate the monitor. If you click Revert again, you will apply the settings from the latest LUT.

Calibrating the Monitor Manually

gamma:adjusting for the monitor manually
monitor calibration:adjusting manuallyIf you do not have access to a colourimeter, you can adjust the monitor gamma level manually.

To calibrate the monitor manually:

- 1 In the Calibrate menu, enable Gamma, and then drag the Gamma slider.



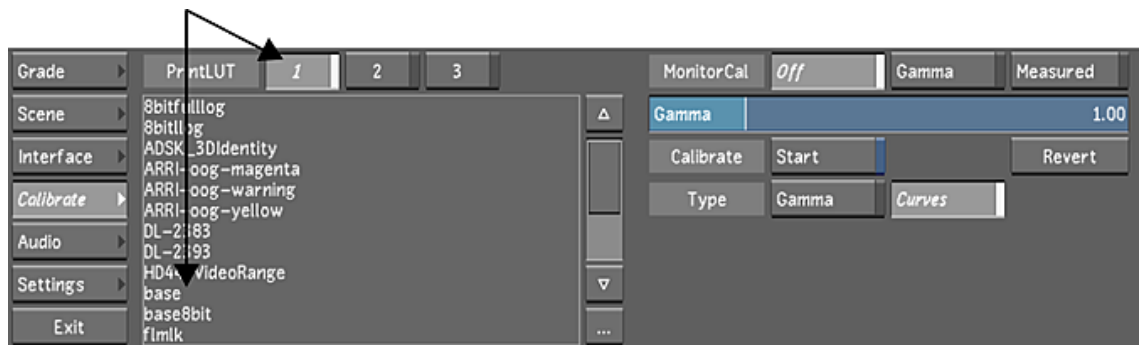
Calibrating for Dual-Head Mode

monitor calibration:for dual-head modeIf the video card on the Lustre system is set to Dual-Head mode, you can set different LUTs for each monitor. This is useful when using different display types, such as a monitor and a plasma screen.

To set different LUTs:

- 1 (Optional) Import a LUT into the LUT list. See [Importing a LUT File](#) (page 382).
- 2 In the Calibrate menu, click 1 for the main monitor and select a 3D LUT for the main LUT.

NOTE A 3D LUT is processed directly on the video card and therefore ensures better performance in Lustre.



- 3 Click 2 and select any LUT for the second monitor.

NOTE This setup will not affect playback speed unless a 3D LUT is also chosen for the second monitor.

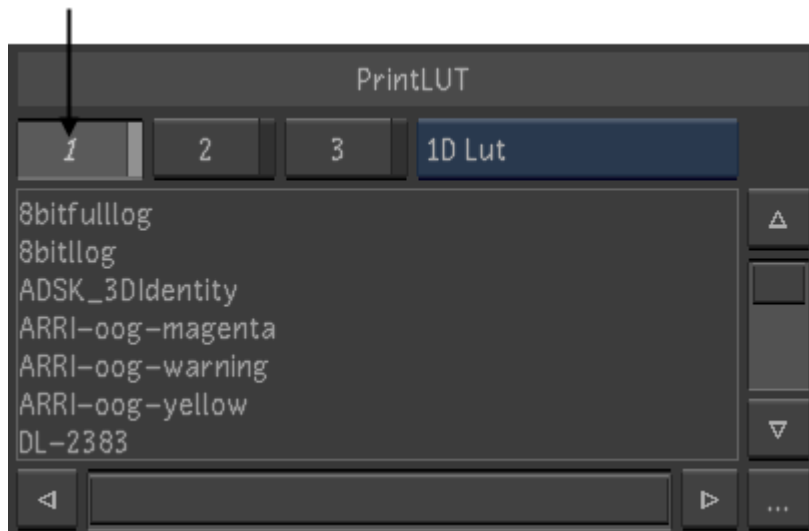
Applying LUTs for Viewing (Print LUTs)

Use viewing LUTs (Print LUTs) to apply preset gamma correction and other transforms to the displayed images. These LUTs allow you to preview images as they will appear on different devices or media without changing the underlying colour values.

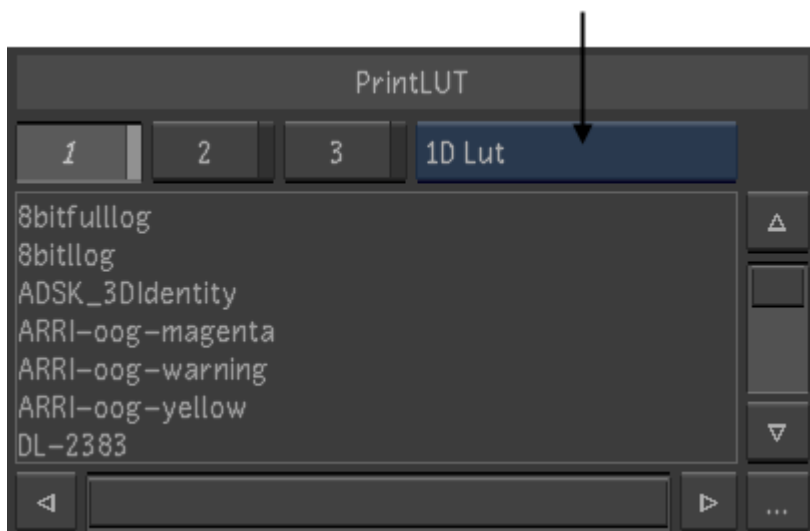
Defining Print LUTs for Viewing

You can define up to three viewing LUTs (Print LUTs) and switch between them for quick comparisons.

- 1 In the Setup / Calibrate menu, click the number of the Print LUT to assign.



- 2 Select the type: 1D Lut, 3D Lut, or Colour Transform.



- 3 Do one of the following:
 - Select an item list.
 - Click the Browse (...) button at the lower right to select a LUT or colour transform from your file system.

The Print LUT is assigned to to the corresponding number.



- 4 Repeat to assign LUTs or colour transforms to the other numbers.

Switching Between Print LUTs for Viewing

You can switch between viewing LUTs (Print LUTs) to change the display of your images anytime during a session.

- 1 Do one of the following:
 - In the Calibrate menu, click 1, 2, or 3.
 - Click the LUT button to toggle through the assigned Print LUTs.



The selected Print LUT is applied to the display.

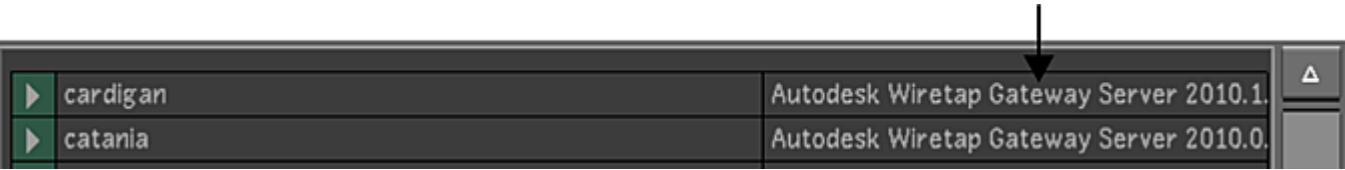
Browsing for Footage

9

Accessing the file browser is one of the first steps of the grading process. Use the file browser to locate scanned or captured footage on your direct storage or shared networked storage.

browsing for footage You can import a large number of media file formats via the File Browser using the Wiretap Gateway. You can access a local or remote host that is running a Wiretap Gateway and import Flame and Smoke sequences, for example. For more information about the Wiretap Gateway, refer to the *Autodesk WiretapCentral and Wiretap Gateway Installation and Configuration Guide*.

NOTE The <HOME> prefix will not appear on media coming from the Wiretap Gateway or on managed media residing on the Standard FS.



Natively Supported Media File Formats

supported file formats, in Lustre file formats, supported for playback The following file formats are all natively supported in Lustre:

- DPX (8-bit, 10-bit, 16-bit)
- Cineon (8-bit, 10-bit)
- TGA (8-bit, 16-bit)
- TIFF (8-bit, 16-bit)
- SGI (8-bit, 16-bit)
- BMP (8-bit, 8-bit w/alpha)

NOTE The BMP format is only supported on Windows.

For more information on Wiretap Gateway supported media files, see [Wiretap Gateway Supported Media File Formats](#) (page 192).

Wiretap Gateway Supported Media File Formats

About 32-bit float Support

- It is now possible to import 32-bit float media through Wiretap Gateway, Wiretap server, and locally. However, the media is converted to 16-bit float on import.
 - Media Import: OpenEXR (including Multi-Channel).
 - Wiretap Interchange: 32-bit media and sequences loaded from Flame through the Source Grading workflow are converted to 16-bit float on import in Lustre and returned to Flame as 16-bit float media. Sequences are flagged as 32-bit float.

NOTE The Connected Colour Workflow clamps the Lustre and Read File nodes to 16-bit float.

Image Sequence

Format	Extension	Import	Export	Depth
Alias®	.als	yes	yes	8 bits
ARRIRAW	.ari	yes	no	12 bits
NOTE Media is presented as a clip, never as a sequence of RAW images. Supports material shot on camera using ARRI SUP 11 or earlier, and the features from version 4.6 of the ARRIRAW SDK. This includes support for ALEXA Monochrome and ALEXA Open Gate, as well as content shot at 4x3 ratio.				
Cineon®	.cin	yes	yes	10 bits
DPX	.dpx	yes	yes	8, 10, 12, 16 bits and ADX encoding.
DPX - Single channel	.dpx	yes	no	See Note.
NOTE Monochromatic DPX files from the following film scanners have been validated: ■ FilmLight Northlight (10 & 16-bit) ■ DigitalFilmTechnology SCANITY™ (10 & 16-bit) ■ Imagica (8, 10 & 16-bit) ■ Laser Graphics (8, 10 & 16-bit) Lustre supports single channel DPX files only when imported through Wiretap Gateway.				
Gateway	.clip	yes	no	n/a
HDR	.hdr	yes	no	32 bits
JPEG	.jpg	yes	yes	8 bits
OpenEXR	.exr	yes	yes	8, 10, 12u, 12, 16 fp bits

Format	Extension	Import	Export	Depth
	Export includes OpenEXR with RLE (Run-Length Encoding) compression. Multi-Channel OpenEXR with single channel Alpha are supported.			
	NOTE ■ Lustre does not render RGBA OpenEXR files. Do not use the Same As Scans rendering option. Use the OpenEXR RGB rendering option if you want to render 16-bit half float media files.			
OpenEXR 2.0	.exr	yes	no	8, 10, 12u, 12, 16 fp bits
	NOTE ■ Multi-part and deep pixel features are not supported: only the first part of a multi-part file can be accessed, and deep pixel channels are ignored. ■ Lustre does not render RGBA OpenEXR files. Do not use the Same As Scans rendering option. Use the OpenEXR RGB rendering option if you want to render 16-bit half float media files. ■ The resolution of the matte channels has to be identical to the beauty pass that will be used for secondary color grading.			
Photoshop	.psd	yes	no	8 or 16 bits
	NOTE Supports RGB and RGBA.			
Pict (Macintosh®)	.pict	yes	yes	8 bits
Pixar	.picio	yes	yes	8 bits
Portable Network Graphics	.png	yes	no	8 or 16 bits
	NOTE Supports alpha.			
Precomp	.precomp	yes	no	8, 10, 12u, 12, 16 fp, or 32 fp bits
SGI®	.sgi	yes	yes	8 or 16 bits
Softimage®	.pic	yes	yes	8 bits
TARGA®	.tga	yes	yes	8 bits
Tdi/Maya®	.iff	yes	no	8 or 16 bits
Tiff	.tif	yes	yes	8 or 16 bits

Format	Extension	Import	Export	Depth
Wavefront®	.rla	yes	yes	8 or 16 bits

QuickTime

Format	Extension	Import	Export	Depth
8-bit Packed YUV 4:2:2	.mov	yes	yes	
NOTE Lossy codec. Avoid using for intermediates.				
10-bit Packed YUV 4:2:2	.mov	no	yes	
NOTE Lossy codec. Avoid using for intermediates.				
Apple Animation	.mov	yes	no	with alpha
Apple Graphics	.mov	yes	no	
Apple® Video	.mov	yes	no	
Cinepak	.mov	yes	no	
Component Y'Cb-Cr 8-bit 4:4:4	.mov	yes	no	8-bit planar
Component Y'Cb-CrA 8-bit 4:4:4:4	.mov	yes	no	8-bit planar
Component Y'Cb-Cr 10-bit 4:4:4	.mov	yesq	no	10-bit packed
Component Y'Cb-Cr 10-bit 4:2:2	.mov	yes	no	10-bit packed
Component Video	.mov	yes	no	8-bit packed
NOTE 4:2:2 format				
DV 25 NTSC	.mov	yes	yes	
NOTE NTSC & PAL				
Although the specifications allow the DV format to be field 1 or 2, the industry standard is "bottom first". Thus, before exporting to Flame Premium, ensure that the clip is Field 2. Reformat, if necessary.				

Format	Extension	Import	Export	Depth
DVCPRO 50	.mov	yes	yes	
				NOTE NTSC & PAL
DVCPRO HD	.mov	yes	yes	
DNxHD	.mov	yes	yes	8 bits: 36, 145, 220 (and variants) 10 bits: 220x (and variants)
				NOTE Includes support for the following varieties: 36, 60, 75, 80, 85, 90, 90x, 100, 110, 110x, 115, 145, 175, 175x, 185, 185x, 220, 220x, 444 (sometimes known as 350x).
H.264	.mov	yes	yes	
IMX	.mov	yes	yes	
				NOTE Includes support for IMX 30, 40, and 50.
MJPEG	.mov	yes	yes	
				NOTE JPEG compatible
MPEG-1	.mov	yes	no	
MPEG-4	.mov	yes	yes	
MSMpeg 4v3 (DivX)	.mov	yes	no	
PhotoJPEG	.mov	yes	no	
				NOTE RT PhotoJPEG compatible
PNG	.mov	yes	yes	without alpha
PNGA	.mov	yes	yes	with alpha
ProRes 4444	.mov	yes	yes	12-bit
				NOTE Includes support for the XQ variant, and for ProRes files from Sony F5 and F55 cameras.
ProRes 422 (HQ)	.mov	yes	yes	10-bit

Format	Extension	Import	Export	Depth
	NOTE Includes support for ProRes files from Sony F5 and F55 cameras.			
ProRes 422	.mov	yes	yes	10-bit
	NOTE Includes support for ProRes files from Sony F5 and F55 cameras.			
ProRes 422 (LT)	.mov	yes	yes	10-bit
ProRes 422 (Proxy)	.mov	yes	yes	10-bit
Quicktime Planar RGB	.mov	yes	no	
RGB Uncompressed	.mov	yes	yes	without alpha
RGBA Uncompressed	.mov	yes	yes	with alpha
TGA	.mov	yes	no	
	NOTE TARGA			
XDCAM	.mov	yes	no	
XDCAM HD	.mov	yes	no	
XDCAM EX	.mov	yes	no	
	NOTE There is no essence-mode browsing in a QuickTime XDCAM EX.			

MXF

Format	Extension	Import	Export	Depth
AVC-Intra 50	.mxf	yes	yes	
	NOTE Panasonic P2			
AVC-Intra 100	.mxf	yes	yes	
	NOTE Panasonic P2. Import includes support for 1080/60p. Import supports OP-Atom format.			

Format	Extension	Import	Export	Depth
AVC-Intra 200	.mxf	yes	no	
AVC-Intra2K	.mxf	yes	no	
	NOTE Supports the VariCam 35 and HS, both 4:2:2 and 4:4:4 flavours.			
AVC-Intra4K	.mxf	yes	no	
	NOTE Supports the VariCam 35 and HS, both 4:2:2 and 4:4:4 flavours.			
AVC-LongG	.mxf	yes	no	
Canon XF-AVC	.mxf	yes	no	
DNxHD	.mxf	yes	yes	
	NOTE Includes support for the following varieties: 36, 60, 75, 80, 85, 90, 90x, 100, 110, 110x, 115, 145, 175, 175x, 185, 185x, 220, 220x, 444 (sometimes known as 350x). Supports DNxHD files from ARRI ALEXA cameras, with the exception of DNxHD 444. Supports DNxHD 220x and 145 from Sony PMW-F5 and F55.			
DV 25	.mxf	yes	no	
	NOTE Panasonic P2			
DVCPRO	.mxf	yes	yes	
	NOTE Panasonic P2			
DVCPRO 50	.mxf	yes	yes	
	NOTE Panasonic P2 (PAL & NTSC)			
DVCPRO HD	.mxf	yes	yes	
	NOTE Panasonic P2. Available in 1080p@25/50, 1080p@24/30/60, 720p@25/50, and 720p@24/30/60.			
SonyRAW	.mxf	yes	no	
	NOTE Flame Premium uses Sony's SDK 2.3.1 to decode SonyRAW files. It includes support for Sony F65, F55, and F5 camera outputs.			

Format	Extension	Import	Export	Depth
Sony SStP	.mxf	yes	no	
				NOTE Sony's implementation of MPEG-4 Simple Studio Profile, part of the SRMASTER format. The following Sony SStP formats are supported: ■ Lite (10-bit / YUV 422 / 220 Mbps) ■ SQ (10-bit / YUV 422 / 440 Mbps) ■ HQ (10-bit or 12-bit RGB 444 / 880 Mbps) These formats are supported in 1080PsF (23,97, 24, & 25), 1080i (50 & 59,94), and 720p (50 & 59,94).
XAVC	.mxf	yes	yes	
				NOTE Includes support for Sony F55 and F5 camera, recorded in HD and 4K. Includes support for long-GOP files (Sony XAVC-Long format) such as recorded by the PXW-Z100.
XDCAM	.mxf	yes	no	
				NOTE MPEG-2 IMX 30, 40, and 50
XDCAM HD	.mxf	yes	yes	
				NOTE MPEG-2 long-GOP. Import supports 4:2:0 and 4:2:2. Export: 4:2:2.

NOTE Flame Premium exports MXF as OP-1a files (including the timecode). The is audio encoded as PCM, 16-Bit or 24-Bit. Avid applications support OP-Atom MXF files: use the AMA MXF plug-in to bring the OP-1a files into an Avid application.

MP4

Format	Extension	Import	Export	Depth
H.264	.mp4	yes	no	
XAVC-S	.mp4	yes	no	
XDCAM EX	.mp4	yes	no	
				NOTE MPEG-2 long-GOP

Other Streaming Codecs

Format	Extension	Import	Export	Depth
AVCHD	.mts or .m2ts	yes	no	

Format	Extension	Import	Export	Depth
	NOTE Only linear PCM audio is supported. Some cameras can record AC-3 audio, but this format is not supported. Only the video portion of AVCHD media with AC-3 audio content is accessible from Flame Premium.			
REDCODE	.r3d	yes	no	RAW
	Flame Premium uses RED SDK 5.3, including support monochrome R3D media and EPIC DRAGON footage.			

Audio File Formats

Format	Extension	Import	Export	Depth
AIFF	.aiff	yes	yes	16 or 24
AIFF-C	.aifc	yes	yes	16, 24, 32 (float)
Audio Visual Research	.avr	yes	yes	16
Berkeley/IR-CAM/CARL Sound (BISCF)	.bsf	yes	yes	16
MP3	.mp3	yes	yes	16
Nextsnd	.au	yes	yes	16, 24, 32 (float)
WAVE	.wav	yes		16, 24, 32 (float)
WAVE - Broadcast	.wav	yes	yes	16, 24, 32 (float)
	NOTE Includes support for RF64 files (BWF-compatible format that supports files larger than 4 GB).			
WAVE - Extensible	.wav	yes	no	16, 24, 32 (float)
	NOTE Audio tracks are imported as regular audio tracks, without mapping the channels to spatial locations.			

NOTE Files of any sample rate can be imported, but they are all resampled to 48 kHz.

Pixspan Support

Flame supports Pixspan 3 compression, when importing and exporting media.

Pixspan is a lossless compression algorithm that preserves the original media container and metadata while compressing the original media file.

Pixspan enables the following formats to be **decoded on import and encoded on export**:

- DPX
- Cineon
- EXR (Uncompressed only)
- TIFF (Uncompressed only)

Pixspan enables the following formats to be **decoded on import**:

- Pixspan encoded ARRIRAW media files

It is also possible to export content with the Link To Original Media option, to avoid duplicating media files on the destination file system. Compressed Intermediates with Pixspan compression is not supported.

Files encoded with Pixspan compression have a double extension: the original extension, plus “.pxz” (ex. dpx.pxz).

The Pixspan plugin is included with the application and supports decoding, out of the box. If you want to use Pixspan for encoding as well, you will have to properly license the plugin.

Files exported through Pixspan generate thumbnails when encoded using Autodesk products. These thumbnails can be seen under the Mac OS X Finder, making media browsing easier. This requires a Mac OS X QuickTime component available from Pixspan.

For more information on Pixspan, visit: <http://pixspan.com>.

MediaReactor Support

Drastic Technology MediaReactor is a new import plugin for Wiretap Gateway, that allows the ingest of multiple file formats not currently supported by Autodesk products. Among others, the following formats are available:

- Vision Research Phantom CineRAW (.cine)
- Cinema DNG (AJA CION, Blackmagic cameras, etc) (.dng)
- Canon C500 RAW (.rmf)
- Panasonic Varicam RAW (.vraw)
- Jpeg2000 (MXF)
- MediaReactor options are available in the Image / Transcode menu.
- Modifying the preprocessing options of MediaReactor imported media from the Flame Family products now displays the proper result. The edited values now match in both applications.
- For RAW media formats, the following options are available:
 - Colour Menu: From File Header: Uses the default attributes of the media, as captured by the camera. This option is selected by default.
 - Gamma: Use to modify the clip's Gamma curve.
 - Black: Use to modify the clip's black point.
 - White: Use to modify the clip's white point.
 - Exposure: Use to modify the clip's exposure.
 - Red Gain: Use to add or remove Red to the clip.
 - Blue Gain: Use to add or remove Blue to the clip.

NOTE Because Transcode settings are source based, use the MediaReactor entry in the Selector to copy settings from shot to shot or to a selection of shots.

MediaReactor supports many more file formats than those listed above; including Cineform DPX, Flash Video, HDV, Matroska (MKV), Mpeg 1/2/4, Avid DV25, DV50, HDV, Uncompressed (MXF), Windows Media, WebM and many more. However, only the formats listed above have been validated and are officially supported.

You must download and install the Drastic plugin, [available here](#). Once installed, you can select MediaReactor from the File Format box in the MediaHub and browse to, and import the above file formats.

NOTE After installing the MediaReactor plugin, you must restart the Wiretap Gateway.

For more information on Drastic, visit: www.drastic.tv.

MediaReactor Installation / Uninstallation Procedure

NOTE You can install a new MediaReactor over an older version: you do not need to uninstall the older version beforehand.

Installation

- 1 Exit Lustre.
- 2 Download the file to the Linux workstation. /usr/tmp is a good spot.
- 3 Open a shell.
- 4 Change directory to /usr/tmp. Type: `cd /usr/tmp`
- 5 Unzip the file. Type: `unzip SetupMRWS_Linux-x86_64_2016_Beta.zip` and wait for the process to finish.
- 6 You now need to find the unzipped file. Type: `ls SetupMRWS_Linux`. Look for the file that does not end with .zip. Note that name. In the following steps, we will use SetupMRWS_Linux-x86_64_5_0_154 as an example: you will need to change the name to reflect your situation.
- 7 Change the file permissions. Type: `chmod 777 SetupMRWS_Linux-x86_64_5_0_154`.
- 8 Launch the installer. Type: `./SetupMRWS_Linux-x86_64_5_0_154`
- 9 Follow the on-screen instructions.
- 10 Close the shell once the installation is complete.

Once the MediaReactor component is installed, you need to restart Wiretap Gateway.

- 1 From the Editing / Browse menu, click Restart WTG.

Once all three services are green, you are good to go and relaunch Lustre.

Uninstallation

- 1 Exit Lustre.
- 2 Open a shell.
- 3 Change directory the MediaReactor install directory. Type: `cd /opt/mediareactor`
- 4 Launch the uninstaller. Type: `./uninstall`
- 5 Once MediaReactor is uninstalled, you must restart Wiretap Gateway. See the instructions above.
- 6 Relaunch Flame.

GPU RAW Media Decoding

Flame and Lustre support GPU RAW Media Decoding for the ARRIRAW and RED file formats, providing much faster decoding speeds. GPU RAW Media Decoding is enabled by default, if the following conditions are met:

- GPU RAW Media Decoding requires the NVidia Quadro 6000, Quadro M6000 or Quadro K6000.
- You must update to the latest DKU.
- For ARRIRAW media, Debayering must be set to ADA-SW5. This is the default setting.

NOTE In Lustre, the new ADA 5 SW Sharpening controls are located in Image / Transcode / Format menu. As always, you can copy these settings using the Selector.

- For RED, Colour Science must be set to version 3.x. This is the default setting.

About GPU Decoding and Wiretap Gateway Slaves

With GPU decoding, the concept of Wiretap Gateway local decoding slaves is being slowly phased out.

The slaves mechanism had a significant impact on performances for R3D CPU Decoding. No slaves will be used by default for R3D decoding when a GPU decoding capable system is detected (Q6000 and above) unless NumLocalSlaves is explicitly set to a non zero value (it is commented out by default). See the comments in the [Slaves] section of the file /opt/Autodesk/wiretapgateway/cfg/wiretapgateway.cfg.

Keep in mind that, as mentionned in the wiretapgateway.cfg file, R3D files using Color Science 2.x or HDRx cannot be GPU-decoded, in which case you will need to configure NumLocalSlaves.

End-to-end 4K and UltraHD Support

SDI Preview (Supported by Flame and Lustre - Linux only)

Lustre 2015 and up supports 4K Preview timings and UltraHD 4K footage (UHDTV). On systems with an AJA Kona 3G card or an AJA Kona 4G card, the following timings are supported:

AJA Kona 3G:

- 3840x2160 (23,97p, 24p, 25p, 29.97p, 30p)
- 4096x2160 (23,97p, 24p, 25p, 29.97p, 30p)

AJA Kona 4G:

- 3840x2160 (23,97p, 24p, 25p, 29.9p, 30p, 50p, 59.94p, 60p)
- 4096x2160 (23,97p, 24p, 25p, 29.9p, 30p, 50p, 59.94p, 60p)

NOTE

- In order to use the AJA Kona 3G card in Lustre 2015, you must update the card's firmware to Firmware version "2014/03/19 07:22:10". A script is installed on the workstation when you install the application in `/usr/autodesk/lustre_2015/cfgAjaUpdate`, that enables you to upgrade and downgrade the AJA Kona 3G's firmware. To run the script to upgrade the firmware for 2015, from a shell, type the following command: `cfgAjaUpdate 2015`. Once the card is upgraded, it is recognized as AJA Kona 3G **Quad**.
- Once you have upgraded the card to the AJA Kona 3G Quad firmware, it is no longer be useable with pre 2015 versions of Lustre. If you are running a pre 2015 version of Lustre alongside a 2015 version, you must run this script again, with the `[pre2015]` variable to downgrade the AJA Kona 3G' Quads firmware. To run the script to downgrade the firmware for pre 2015, from a shell, type the following command: `cfgAjaUpdate pre2015`.
- If you have downgraded the card's firmware and want to use it again in Lustre 2015, you must re-update the card's firmware, by running the following command: `cfgAjaUpdate 2015`.
- After running the script, you must power down and reboot your workstation, to make sure the appropriate AJA board firmware is properly installed.
- UHDTV and 4K preview require the AJA Kona 3G Quad card. No Graphic SDI timing should be enabled when working with Video Device SDI timing. Also, when monitoring with the AJA board, the Screen Grab feature is not available (CTRL F7).

You can set the Video Device SDI to these timings, from the Engineering tab of the Project Management menu, using the Timing drop down menu:

- UHDTV
- Film: 4K Timings

It is also possible to change the timing from the Editing / Capture and the Editing / Payout menus. In Lustre 2016, you can use the AJA board with Dual Link RGB (10-bit 444) in 3G mode for HD, UHDTV, and 4K rasters.

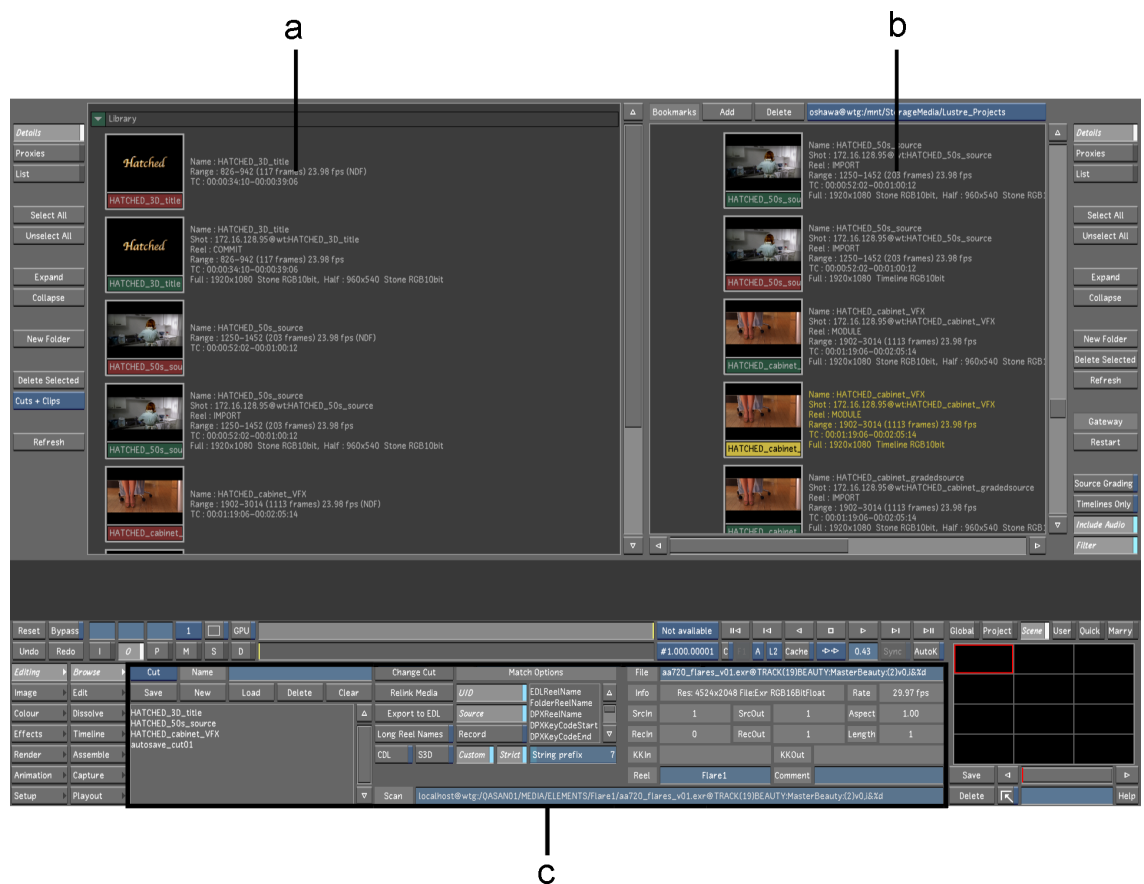
- 1 Select Dual Link.
- 2 Select 3G.
- 3 Select 4:4:4.
- 4 Select the HD/UHDTV or 4K timing you want to use.

Accessing the File Browser

Library:loading shots from the file browserfile browser, accessingUse the file browser to locate shots and load them into the Library.

To access the file browser:

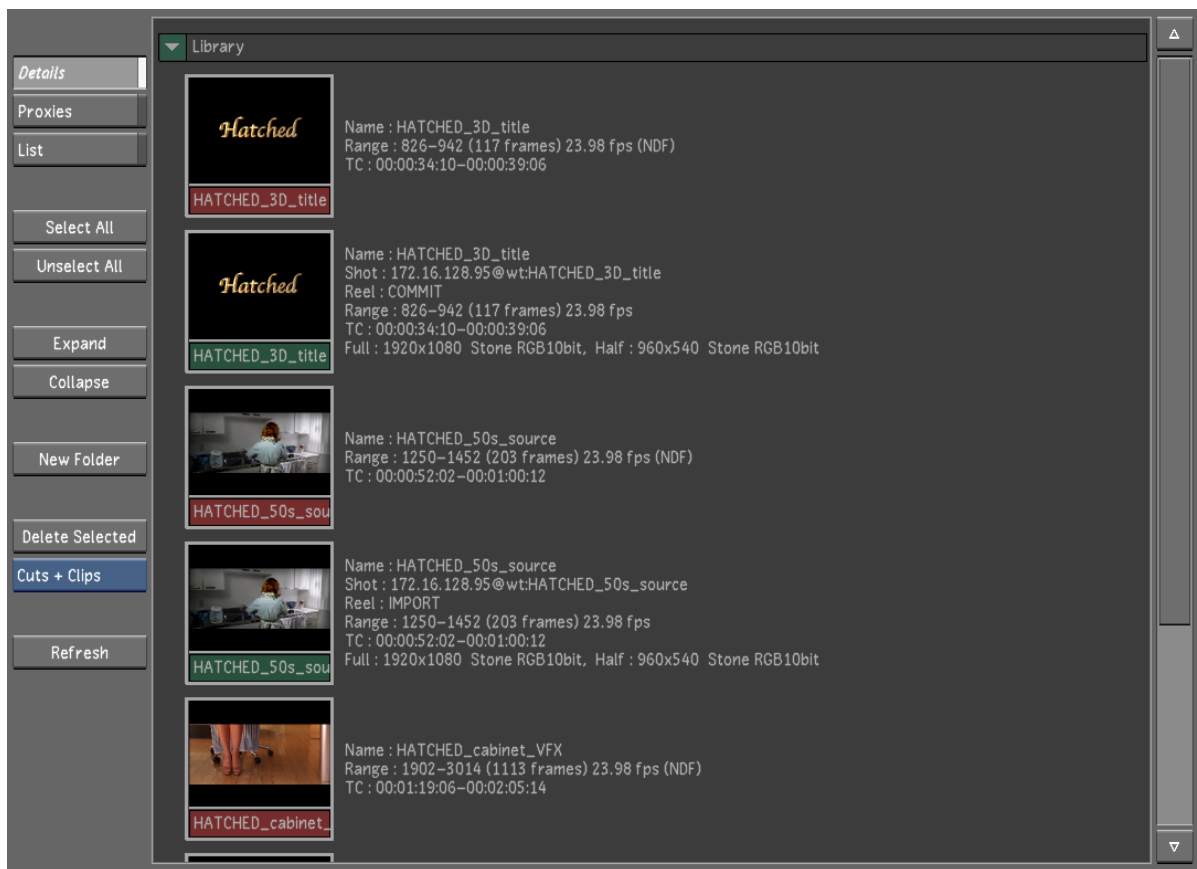
- 1 Click Editing, and then click Browse.
The Browse menu and the file browser appear.



Footage courtesy of EVN PRODUCTIONS(a) Library (b) File browser (c) Browse menu

When you are in the Browse menu, the work area is divided into three areas.

Library Use to organize your cuts and clips.

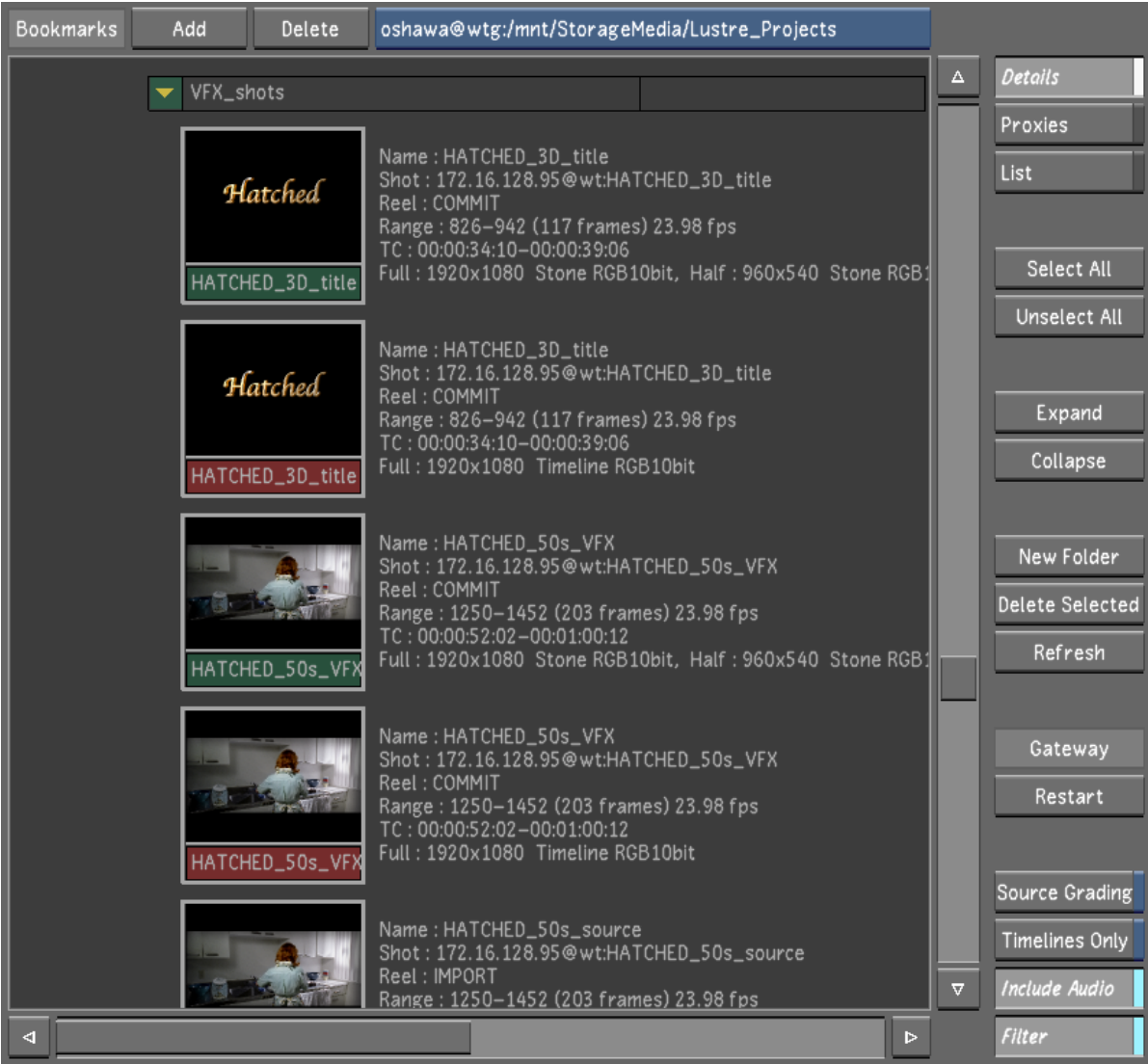


Footage courtesy of EVN PRODUCTIONS

Click:	To:
Details	Display clips in Thumbnail and Text view.
Proxies	Display clips in the Library as thumbnails.
List	Display clips in Text view.
Select All	Select all cuts and clips in the Library.
Unselect All	Deselect the selected cuts and clips in the Library.
Expand	Display the contents of the selected folder.
Collapse	Hide the contents of the selected folder.
New Folder	Create a new folder. First select the main folder under which the new one is to be created. Rename the folder by right-clicking it and entering a new name (the root, <i>Library</i> , cannot be renamed).
Delete Selected	Delete selected item.

Click:	To:
Cuts/Clips option box	Select the type of media to delete within the selection. The options are: Cuts, Clips, Cuts+Clips.

File browser Use to locate footage and bring it into the Library. When accessing footage from the local or network storage, always place the files into the Scans Full home directory. Footage located under this directory will show a <HOME> prefix before their path when imported in the library.



Footage courtesy of EVN PRODUCTIONS

Click:	To:
Add	Add the current folder location to the bookmark list in the Bookmarks box.
Delete	Remove the folder displayed in the Bookmarks box from the bookmark list.
Details	Display clips in Thumbnail and Text view.

Click:	To:
Proxies	Display clips in the Library as thumbnails.
List	Display clips in Text view.
Select All	Select all clips in the file browser.
Unselect All	Deselect the selected cuts and clips in the Library.
Expand	Display the contents of the selected folder.
Collapse	Hide the contents of the selected folder.
New Folder	Create a new folder in the currently selected folder. Rename the new folder by right-clicking it and entering a new name (the root folder cannot be renamed). Clips already in the file browser cannot be moved to the new folder.
Delete Selected	Delete selected shots.
Refresh	Rescan the file systems and update the file browser with up-to-date information.
Timelines Only	Display only the timelines in the File Browser. See Browsing for Remote Footage (page 712).
Include Audio	Imports audio tracks from the Wiretap server. See Importing Audio From Wiretap (page 685).
Filter	Hide specified folders (defined in the <i>init.config</i> file) from the file browser view.

Browse menu Use to create and manage the cuts in the project. See [Managing Cuts](#) (page 101).

Viewing Media File Information

In the File Browser or the Library, you can view information about the media files that make up the clip.

You can view the files in different modes.

Footage courtesy of EVN PRODUCTIONS



Proxies

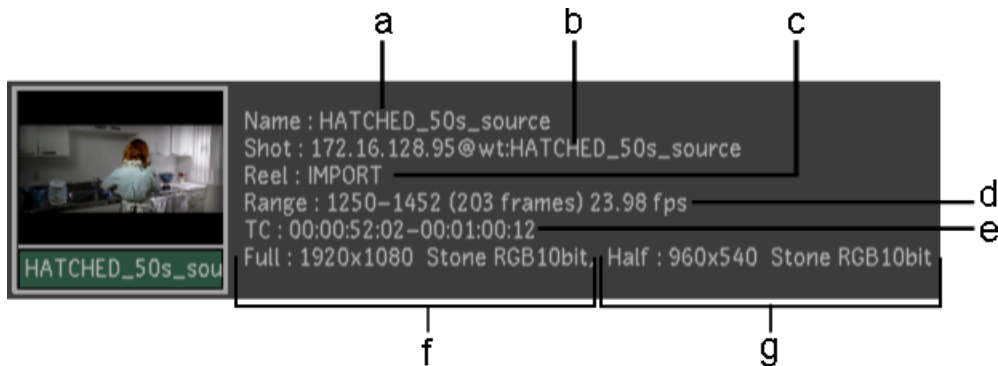
Details

List

NOTE Make sure the cursor is in the Library or File Browser, and press **B** to switch between view modes in that area.

In Proxies view, the thumbnail is displayed and there is no text information.

In Details view, the following information is displayed.



Footage courtesy of EVN PRODUCTIONS (a) Clip name (b) Clip location (c) Reel name (d) Frame range, number of frames, and frame rate (e) Timecode range (f) Full resolution and file format (g) Half resolution and file format

In List view, the following information is displayed.

Shot Place	Full	Half	Range	Frames	Timecode
HATCHED_3D_title			826-942	117	00:00:34:10-00:00:39:06
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	960x540 Sto RGB10bit	1250-1452	203	00:00:52:02-00:01:00:12
HATCHED_cabinet_VF			1902-3014	1113	00:01:19:06-00:02:05:14
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	960x540 Sto RGB10bit	1875-2987	1113	00:01:18:03-00:02:04:11
autosave_cut01			105702-105773	72	01:13:24:06-01:13:27:05
cut_02			105702-106093	392	01:13:24:06-01:13:40:13
autosave_cut_02			105702-106093	392	01:13:24:06-01:13:40:13
172.16.131.215@wtg:	1920x1080 Tif RGB8bit	N/A	103-154	52	00:00:04:07-00:00:06:10
172.16.128.95@wt:Co	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	-93-7861	7955	-00:00:03:21-00:05:27:13
HATCHED_FINAL_com			-93-7861	7955	-00:00:03:21-00:05:27:13
172.16.128.95@wt:BL	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	3-98	96	00:00:00:03-00:00:04:02
172.16.128.95@wt:BL	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	0-23	24	00:00:00:00-00:00:00:23
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	0-377	378	00:00:00:00-00:00:15:17
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	378-610	233	00:00:15:18-00:00:25:10
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	611-798	188	00:00:25:11-00:00:33:06
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	799-915	117	00:00:33:07-00:00:38:03
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	916-1249	334	00:00:38:04-00:00:52:01
172.16.128.95@wt:Dis	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	0--1	0	00:00:00:00--00:00:00:01
172.16.128.95@wt:Uns	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	0-23	24	00:00:00:00-00:00:00:23
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	0-202	203	00:00:00:00-00:00:08:10
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	1453-1700	248	00:01:00:13-00:01:10:20
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	1701-1874	174	00:01:10:21-00:01:18:02
172.16.128.95@wt:off	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	1875-2987	1113	00:01:18:03-00:02:04:11
172.16.128.95@wt:Pol	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	0-460	461	00:00:00:00-00:00:19:04
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	3450-4003	554	00:02:23:18-00:02:46:19
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	4004-4278	275	00:02:46:20-00:02:58:06
172.16.128.95@wt:clo	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	105702-105773	72	01:13:24:06-01:13:27:05
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	4351-4394	44	00:03:01:07-00:03:03:02
172.16.128.95@wt:clo	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	105819-105868	50	01:13:29:03-01:13:31:04
172.16.128.95@wt:HA	1920x1080 Sto RGB10bit	720x576 Sto RGB10bit	4445-4706	262	00:03:05:05-00:03:16:02

Footage courtesy of EVN PRODUCTIONS

The following information is displayed in List and Details view modes.

Shot place Points to the location of the media files that make up the clip.

Full Indicates the resolution and file format of the full-resolution images that make up the clip.

Half Indicates the resolution and file format of the half-resolution images that make up the clip.

Range Displays the range of frames in the shot sequence that make up the clip.

Frames Displays the number of frames that make up the clip.

Timecode Displays source in and out timecode values that make up the clip.

In the Browse menu, you can also view detailed information about a selected shot in the Storyboard.

Change Cut	Match Options			File	aa720_flares_v01.exr@TRACK(19)BEAUTY:MasterBeauty:(2)v0.i&%d				
Relink Media	UID	EDLReelName	Δ	Info	Res: 4524x2048	File: Exr	RGB16BitFloat	Rate	29.97 fps
Export to EDL	Source	FolderReelName		SrcIn	1	SrcOut	1	Aspect	1.00
Long Reel Names	Record	DPXReelName		RecIn	0	RecOut	1	Length	1
		DPXKeyCodeStart							
		DPXKeyCodeEnd	▽						
CDL	S3D	Custom	Strict	String prefix	7	KKIn		KKOut	
				Reel	Flare1	Comment			
Scan	localhost@wtg:/QASAN01/MEDIA/ELEMENTS/Flare1/aa720_flares_v01.exr@TRACK(19)BEAUTY:MasterBeauty:(2)v0.i&%d								

In Preview 38, the Editing/Browse menu has a new Shot Info user interface that displays extended information about the current shot. The following information is displayed:

- **File Name:** Displays the media file name of the current frame. For long shot names, this field can be scrubbed to the right to reveal the full file name.
- **Information Field:** Displays the resolution, the file type and the bit depth.
- **Frame Rate:** Displays the frame rate of the current shot.
- **Source In / Out:** Displays the Source In and Out points.
- **Aspect Ratio:** Displays the aspect ratio of the current shot.
- **Record In / Out:** Displays the Record In and Out points.
- **Length:** Displays the length of the current shot.
- **Keycode In / Out:** Displays the Keycode In and Out points.
- **Reel Name:** Displays the reel name of the current shot.
- **Comment:** Displays the comments associated to the current shot. For media coming from Wiretap server, this field displays the comment(s) as seen in Smoke and Flame.
- **Scan:** Displays the full media path and file name of the current shot. This field is updated based on the state of the Full Res / Proxy button and on the Output (original media files) or Print views (rendered media files). For long media file paths, this field can be scrubbed to the right to reveal the full file path.

NOTE Timecode data in the Shot Info user interface can be displayed as timecode or as frames, based on the status of the TC/Frame counter.

Bookmarking Folder Locations

You can quickly access file system folder locations using bookmarks. Bookmarks can be applied to local or remote file system folders, Wiretap and Wiretap Gateway server.



The Bookmarks box contains three default shortcuts.

- Scans Full Home navigates to the project Scans Full Home location.
- Current Shot Location navigates to the folder location of the source media for the current shot.
- Current Render Location navigates to the folder location of the rendered media for the current shot.

To add a folder:

- 1 Navigate to the folder you want to bookmark and select it.
- 2 If the folder contains subfolders, do one of the following:
 - Collapse the folder to mark only the main folder for bookmarking.
 - Expand the folder to mark the folder and all subfolders for bookmarking.
- 3 Click Add Bookmarks.
A new entry is added to the Bookmarks box.

To navigate to a folder using bookmarks:

- 1 Click the Bookmarks box.



- 2 Select the bookmarks with the location where you want to navigate.

To delete a Bookmark from the list:

- 1 Select the Bookmark you want to delete.

NOTE

Only one bookmark can be deleted at a time.

- 2 Press Delete Bookmarks, and then confirm the deletion.

User-based Bookmark Data

Bookmark data is user-specific and saved in a file, located inside the User folder location (as defined in the *init.config* configuration file). The file named *UserContext.config* is XML, and it contains the following data:

```
<UserContext user="Marc" parser="1.0" version="2011.1.0.73">
  <BookmarkGroup>
    <Bookmark string="Z:\MEDIA" />
    <Bookmark string="upton@wtg:/QASAN01" />
    <Bookmark string="Z:\Design\cfg" />
  </BookmarkGroup>
</UserContext>
```

TIP Instead of navigating to a location, bookmarks can be added directly to *UserContext.config*.

Library and Reel Creation / Deletion

Library and Reel Creation

When browsing a Wiretap server, you can create Libraries and Library reels, using the New Folder option in the File Browser.

The nature of the newly created folder depends on what is selected:

- If you select a Project, clicking New Folder creates a Library folder within the Project.
- If you select a Library, clicking New Folder creates a Reel folder inside the selected Library.

NOTE If a Library is currently in use in Smoke or Flame, it is marked as Read Only and you cannot create new Libraries or Reels in it until it is no longer in use.

Library and Reel Deletion

When browsing a Wiretap server, it is now possible to delete content like Libraries, Library reels, timelines and source clips.

NOTE If a Library is currently in use in Smoke or Flame, it is marked as Read Only and cannot be deleted until it is no longer in use.

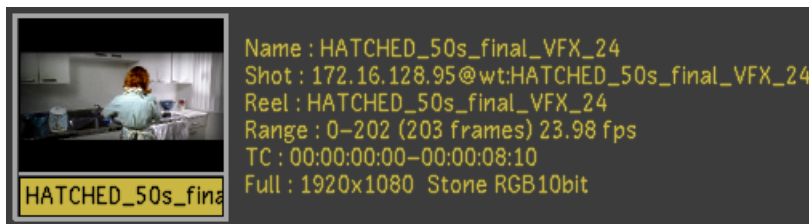
Loading Clips to the Library

loading:shots to the LibraryLibrary:loading shots from the file browserOnce you locate your clips in the file browser, you move them into the Library so that you can use them in your cuts. Clips in the Library are pointers to the actual media files on the file system. You can view information about the clips in both the file browser and the Library.

There are two ways to interact with clips and timelines in the File Browser and Library:

Select shots/timelines:

- Click on the lower portion of the proxy (red or green), to select the shot/timeline. The lower portion of the proxy becomes yellow. You can select multiple clips by clicking Ctrl as you select them.



Footage courtesy of EVN PRODUCTIONS

If you select the wrong clips/timelines, click any unused grey area in the User Interface to cancel your selection.

Pick shots/timelines

- Click on the image portion of the proxy, to pick the clip/timeline. You can pick multiple clips/timelines at once to move/load them simultaneously.

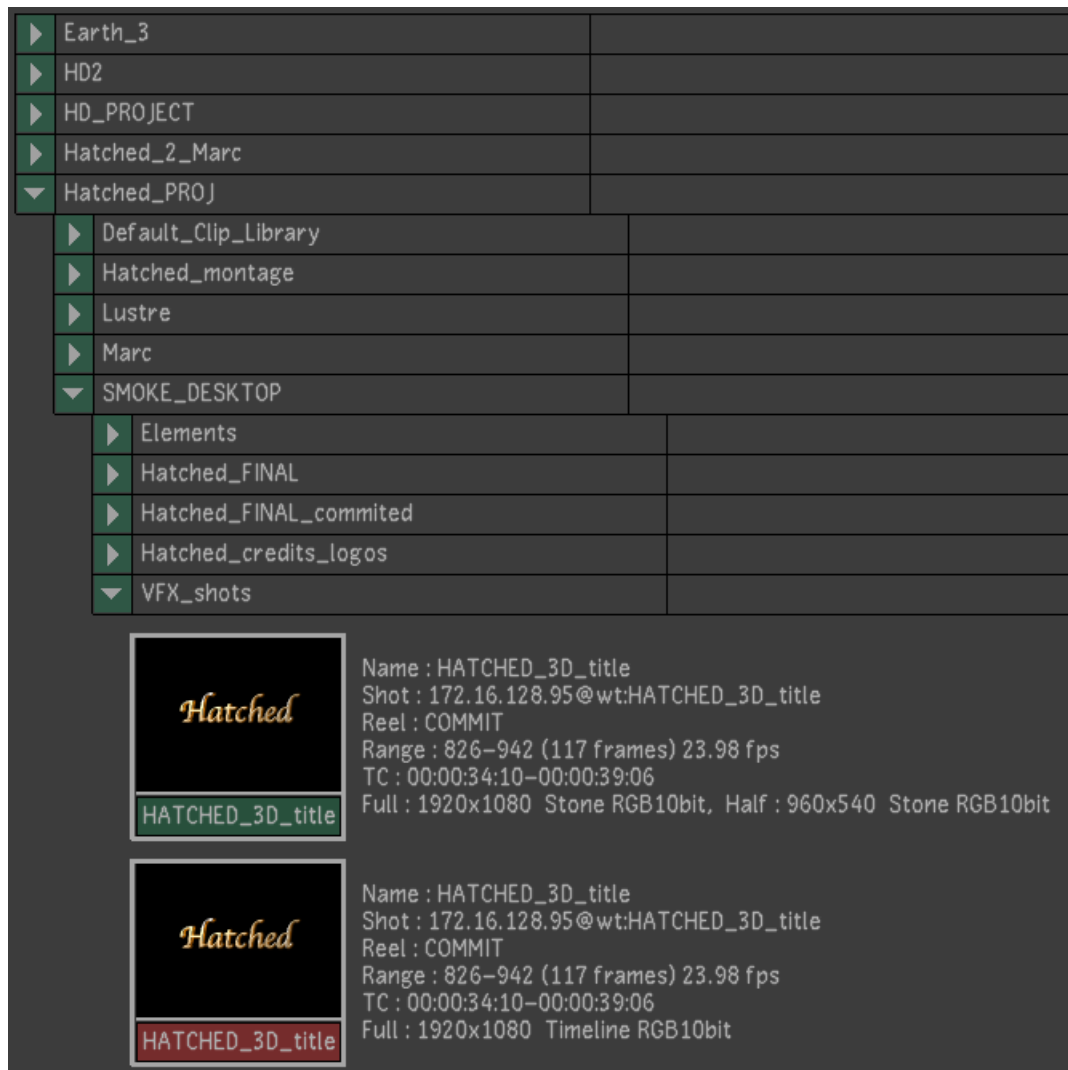


Footage courtesy of EVN PRODUCTIONS

If you pick up the wrong clips/timelines, click any unused grey area in the User Interface to cancel your selection.

To move shots or timelines to the Library:

- 1 Navigate to your clips or timeline.



Footage courtesy of EVN PRODUCTIONS

TIP You can open all of a folder's sub-directories by *Shift*-clicking the arrow to the left of the folder or by using the Expand button.

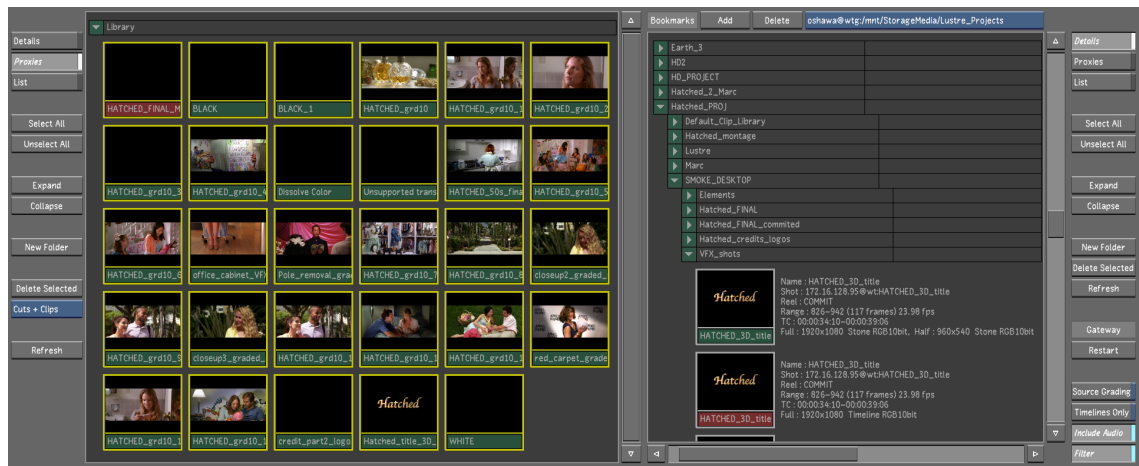
- 2 Select the clips you want to move to the Library.

TIP To select all the clips from a folder, select the folder.

- 3 Drag the selected clips to the Library, and then click to release the clips.

TIP You can drag clips directly from the file browser to the Storyboard. When you do this, the clips are also imported to the Library.

Newly added clips are highlighted. Clips already in the Library are not duplicated.



Footage courtesy of EVN PRODUCTIONS

Deleting Content From the Library

deleting:shots from LibraryLibrary:deleting shots fromshots:deleting from LibraryYou can delete clips and cuts from the Library.

NOTE Deleting clips from the Library does not delete them from the Storyboard.

To delete selected clips from the Library:

- 1 Select the clips you want to delete.
 - 2 Click Delete Selected, and then confirm the action.
- All the selected clips are deleted.

To delete all clips from the Library:

- 1 Click Delete All, and then confirm the action.
- All the clips are deleted.

Creating a Cut with Shots in the Library

loading:shots to the storyboardshots:moving to the storyboardOnce the source clips are imported to the Library, you can assemble them using an EDL or by creating a timeline.

See:

[Working with EDL, ALE and Cutlist Files](#) (page 233)

[Adding Shots to the Storyboard](#) (page 259)

[Adding Shots to the Timeline](#) (page 282)

Matching Shots

You can use Matchback to select a shot in the timeline and find it in the Library, or click a shot in the Library and see where it is used in the timeline.

To match a shot from the Timeline or Storyboard to the Library:

- 1 Select the shot by completing one of the following:

- Click a shot in the Storyboard.
- Place the Timeline positioner on a shot.

- 2 Press `Shift+Q`.

The selected shot is highlighted in the Library.

To match a shot from the Library to the timeline:

- 1 `Alt`-click the shot in the Library.

The selected shot is highlighted in the Storyboard and the positioner is updated in the Timeline.

NOTE If you continue to `Alt-click` the shot in the Library, successive instances of the same shot are highlighted in the Storyboard and positioned in the Timeline.

Transcoding

10

The Wiretap Gateway server makes it possible for Lustre to easily ingest complex media formats. The Transcode menu displays information related to the format of the currently selected media. The full set of options, which include debayering and colour options are only available for RED, ARRIRAW and Sony F65 RAW files, whereas the LUT and resize options are available for any media file imported through Wiretap Gateway. Transcode parameters are greyed out in the Transcode menu when the file format does not support them.

NOTE

- When importing Sony F65 RAW files, a Scene Linear transformation is applied by default, to convert the 16-bit media to 16-bit half-float. To remove this transformation, select Native, from the Colour Space box in the Image / Transcode / Colour menu.

The transcode settings are defined on a shot-by-shot basis. Some of the settings (e.g., Resize and LUT Options menus) can be applied to the media without having to click the Transcode button, and the other settings are not applied until you click the Transcode button. Once you click the Transcode button, the job is sent to the Backburner Manager where it is transcoded. When you begin transcoding, the transcoded media immediately replaces the current media. After the transcoding is complete, the cut is automatically saved and the media paths and processing options are stored in the cut file.

Once the transcode options are set, you can copy select settings from one shot to another using the Transcode Settings parameters found within the Selector. See [Copying Parameters with the Selector](#) (page 146).

Transcode Workflow

transcode:workflowOnce you have imported the RED media and want to improve the playback of this file, follow the typical workflow to transcode your footage.

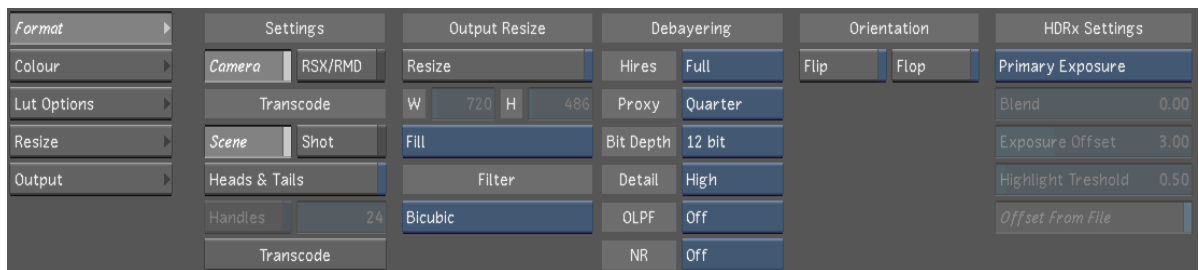
Step:	Refer to:
1. Set the high-level options.	Transcode Format Settings (page 219).
2. Set the initial colour correction.	Transcode Colour Settings (page 222) and Detail, OLPF Compensation, and Noise Reduction in Transcode Format Settings (page 219).
3. Apply a LUT or a colour transform to the media.	Transcode LUT Options (page 223).

Step:	Refer to:
4. Resize the media.	Transcode Resize Options (page 227) .
5. Set the output options and transcode the media.	Transcode Output Settings (page 228).
6. (Optional) Copy the transcode settings from one shot to another.	Copying Parameters with the Selector (page 146).
7. (Optional) Save the transcode settings as a version.	Transcode Versioning (page 230).
8. (Optional) Save the transcode settings as a template.	Transcoding Template (page 231).

Transcode Options

The Transcode menu is divided into five submenus.

NOTE The Settings and Transcode options are available within the Format, Colour, LUT Options, Resize and Output settings tabs.



Format Sets the high-level options for the media decoding (e.g., debayering, resizing, filter, etc.). This submenu is exclusive to RED and ARRIRAW media. See [Transcode Format Settings](#) (page 219).

Colour Sets the colour settings to be transcoded (e.g., colour and curve settings, etc.). This is useful to set the initial colour correction before grading your footage. This submenu is exclusive to RED and ARRIRAW media. See [Transcode Colour Settings](#) (page 222).

LUT Options Applies a LUT or colour transform to the media to be transcoded. This is useful for colour space conversion, for example, before grading your footage. See [Transcode LUT Options Settings](#) (page 223).

Resize Applies a resize to the media, without the need to transcode and generate new media. See [Transcode Resize Options](#) (page 227).

Output Sets the file output settings (e.g., folder structure, timecode, and image format). See [Transcode Output Settings](#) (page 228).

Once these values have been set, you can choose to save the settings to a transcoding template (similar to the project and user settings template option). See [Transcoding Template](#) (page 231).

To enter the Transcode menu, click Image in the Main menu, and then Transcode.

Transcode Format Settings



(a) Fit Method option box (b) Selector

NOTE The Settings and Transcode panel options are also available in the Colour and Output settings tab.

Camera button transcode:format settings Enable to load the original RED media values as set by the RED camera. When the RED media is initially imported, this button is automatically enabled. When you change one of the transcode options, this button is automatically disabled to show that these settings are no longer the original RED camera settings.

RSX/RMD button transcode:format settings Enable to load the values from the latest version of the RSX/RMD file. When a clip is opened in RED ALERT!™, an RSX/RMD file is saved alongside the R3D file, using the same filename. It contains the additional metadata added to the R3D file within RED ALERT!.

Once you change one of the Lustre transcode options, this button is automatically disabled to show that these settings are no longer the original RSX file settings.

Scene button/Shot button Enable Scene or Shot to transcode either the entire scene or the shot that is selected in the Storyboard.

Heads & Tails button Enable to make sure the heads and tails from the RED media are kept when it is transcoded.

Handles button and Handles field Enable the Handles button when you want to transcode fewer heads and tails than what is currently showing in the footage. Enter a value in the Handles field to determine how many heads and tails to transcode. This option can only be used if the Heads & Tails option is enabled.

Transcode button When the format, colour, and output settings have been established, click this button to send the job to the Backburner Manager and transcode the RED media to a DPX file.

Resize button When enabled, the resize settings (i.e., the W and H fields) are implemented when the RED media is transcoded.

W/H field Enter the desired resize setting. Note that a resize setting that is not directly proportional to the size of the original media takes longer to process.

Fit Method option box To use a different aspect ratio during a resize, select one of the following fit method options to be applied to the exported clip.

Select:	To:
Fill	Fit the source, width, and height into the destination frame. If the source and destination frames do not have the same aspect ratio, the image can become distorted. This is the default option.
Crop Edges	Fit one edge of the source into the destination frame without stretching or squashing the frame. Excess parts of the source frame after resizing are cropped. If the source, after the one edge is resized, is wider than the destination, its overhanging left and right

Select:	To:
	edges are cropped. If the source is taller than the destination, the upper and lower edges are cropped.
Letterbox	Fit the source to the destination frame without squashing or stretching it, and without cropping the source. If the source is wider than the destination, black bars fill the top and bottom of the destination frame. If the source is narrower than the destination, black bars fill the right and left sides of the frame. In all cases, the entire source frame is contained within the destination frame.
Centre/Crop	Fit the source image, centred, over the destination frame. If the source is larger than the destination, it is cropped. If the source is smaller than the destination, it is surrounded by a black border.

Filter option box Select the filter option to determine the quality of the interpolated resize result.

Select:	To get:
Bicubic	Very good results for resizing soft-looking images. Use to sharpen the image. This is the default option.
Mitchell	Best results when resizing a clip to a higher resolution.
Triangle	Moderate results with little processing overhead.
Impulse	Quick, low-quality results.
Lanczos	Best results when resizing a clip containing a variety of patterns and elements to a lower resolution. It is the most complex, with the longest processing time.
Shannon	Excellent results when resizing a clip to a lower resolution. Very similar to Lanczos, but results are a little softer.
Quadratic	Good results for resizing simple images with straight edges. Similar to Gaussian, but with more blurring. Use to soften the image.
Gaussian	Excellent results when resizing a clip with no patterns and a lot of straight edges to a lower resolution. Useful for softening some detail.

NOTE The following settings vary based on the type of media.

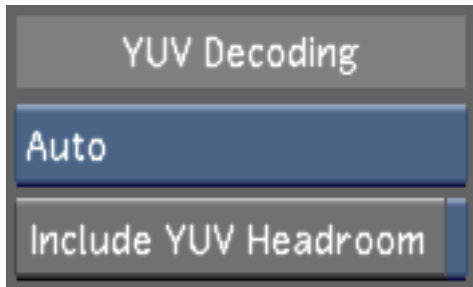
YUV Decoding

The YUV Decoding box allows you to select the YUV colour space used by the clip to import. Because Lustre works in the RGB colour space, it needs to translate YUV information into RGB. This setting ensures that the right decoder is used for this. The Auto setting selects the colour decoder based on the resolution of the clip. Options are:

- Auto
- Rec601

- Rec709
- Rec2020

The Auto options uses Rec601 for standard definition clips and Rec709 for everything else. Specifying the wrong colour space results in colours that are off.



NOTE We recommend using the Auto option even for Ultra HD footage, which will use the Rec709 setting. This is because devices in the field do not correctly use the Rec2020 primaries and it's still the Rec709 primaries that are currently used for most of the Ultra HD footage. The option remains available if you know that your footage was properly encoded in Rec2020.

Include YUV Headroom Enable to include YUV headroom on import for Quicktime and MXF files.

Scale to Full HD Enable to scale MXF P2 & XDCAM HD narrow content to Full HD resolution on import.

Debayering Hires/Proxy option box Select the level of quality required from the debayering algorithm. Higher resolutions take more time to process. Select one of the following options for the full or proxy footage:

- Full
- Half Premium
- Half Good
- Quarter
- Eighth

Bit Depth option box Select the required bit depth. Your options are:

- 12 bit
- 16 bit fp

Detail option box Select the level of detail extraction required. Your options are:

- Low
- Medium
- High

OLPF Compensation option box Select the level of Optical Low Pass Filter compensation to use. The OLPF is a type of sharpening used to compensate for the optical anti-aliasing filter, which can induce softening of the image during recording.

Noise Reduction option box Select the level of noise reduction applied to the debayered shot.

HDRx Settings Select the HDRx Exposure options.

Exposure option box Select the exposure options of your HDRx media.

Select:	To:
Primary Exposure	Select the main exposure of the R3D file
Highlight Exposure	Select the second exposure of the R3D file.
Blend Exposure	Blend the values between the two exposures to create a single image for grading. This option uses both video tracks of their R3D file. Playback performance may be altered.
Magic Motion	The new HDRx merging option provided by RED. This blending algorithm is used to composite tracks A and X of an HDRx clip.
High Dynamic Range	Convert the two exposures into a 16-bit half-float image. When this option is selected, the Debayering / Bit Depth option is automatically set to 16-bit fp and the Gamma Curve setting is set to Scene Linear (16bit fp).
RMD	Define the blending options from the RMD. If there is no RMD, the application defaults to using the A track.

Blend slider Set a value to blend the two exposures of a RED HDRx clip. With HDRx Settings set to Blend Exposures, this field behaves like the blend in REDCINE-X. The blend operation is a blend of the two exposures: -1 shows only the Highlight (X frame), 1 only the Primary (A Frame), and 0 a 50-50 mix. With HDRx Settings set to High Dynamic Range, Blend also attenuates the artefacts created by scene motions. Set to 1 unless you are troubleshooting motion artefacts.

Exposure Offset slider Set how much greater the Primary exposure was compared to the Highlight exposure, in units of stops. Only available when HDRx Settings box is set to High Dynamic Range. The Exposure Offset should be set to match the setting on the camera for how many stops separate the Primary and Highlight tracks. This is typically 2 or 3 stops. Enter the same value used to record the footage or you will get bad results.

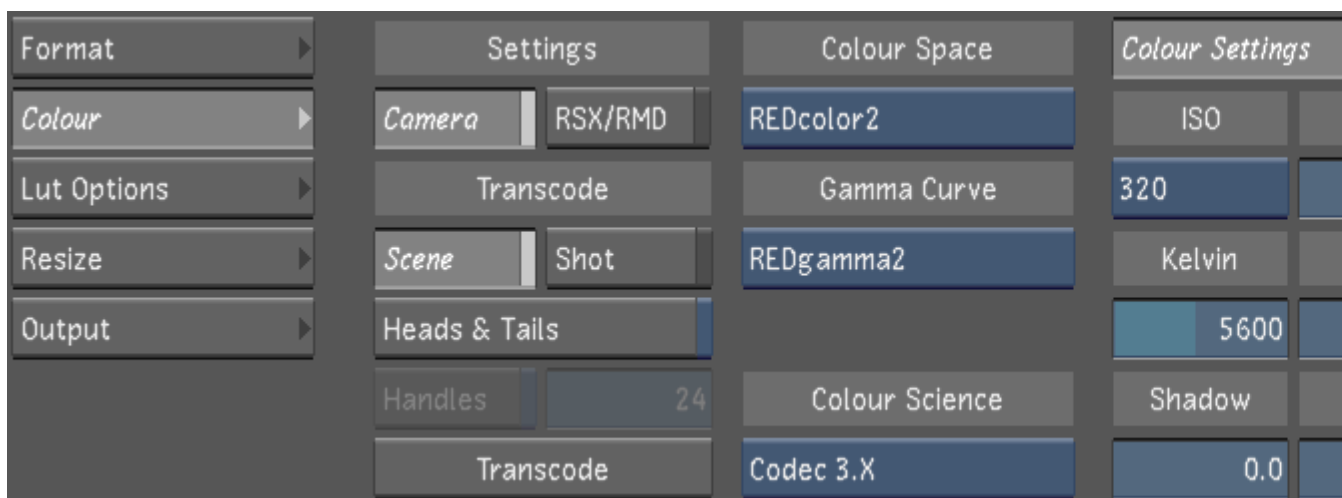
Highlight Threshold slider Set the threshold when pixels from the Highlight exposure are used instead of the over-exposed pixels from the Primary exposure. Only available when HDRx Settings box is set to High Dynamic Range. Set Highlight Threshold last because import options such as ISO or FLUT lighten or darken the image. Too high and you get clipping (often including a magenta-coloured cast), too low and the midtones and shadows have noise leaking in from the Highlight track.

Offset From File button Enable to apply the exposure offset embedded in the file's metadata rather than setting a value manually.

Selector Select the parameters within the respective list to copy the settings from one shot to another. See [Copying Parameters with the Selector](#) (page 146).

Transcode Colour Settings

transcode:colour settings Adjust the values in this Colour settings tab to set the preliminary colour correction to your RED media.



For information on the Settings and Transcode options, see [Transcode Format Settings](#) (page 219).

Colour Space option box Displays the value of the native colour space of the images, as set in the camera. Overriding this value may produce unexpected results.

Gamma Curve option box Displays the value of the output gamma curve that is applied to the shots.

Colour Science option box

Displays the version of the RED codec currently selected (2.X or 3.X). Using the version 3 of the codec gives you access to the FLUT and the Shadow options in the Colour Settings menu, and enables the Lift/Gamma/Gain menu. It also enables the Curve Settings for you RGB channels.

ISO option box Displays the value of the linear gain operation. RED images are always shot at 320 ISO.

Kelvin slider Displays the perceived colour temperature of the image.

Shadow slider Sets the shadow level.

Flut slider Refines the ISO level. As FLUT units are in stops, a +1 FLUT value is the same as doubling the ISO.

Tint slider Adjust the level of green or magenta in the shadow areas of the shot.

DRX slider Adjust the setting for the Dynamix Range Extension (DRX), which sets how much pixel data is copied from non-saturated channels into saturated channels.

Saturation slider Adjust the intensity of the colours in the footage.

Brightness slider Adjust the red, green, and blue levels across the entire image.

Contrast slider Adjust the gradation between the light and dark areas of the footage.

Exposure slider Displays the exposure increments, which are equivalent to f-stops.

Legacy Gain slider Modifies the red, green, and blue within the shot.

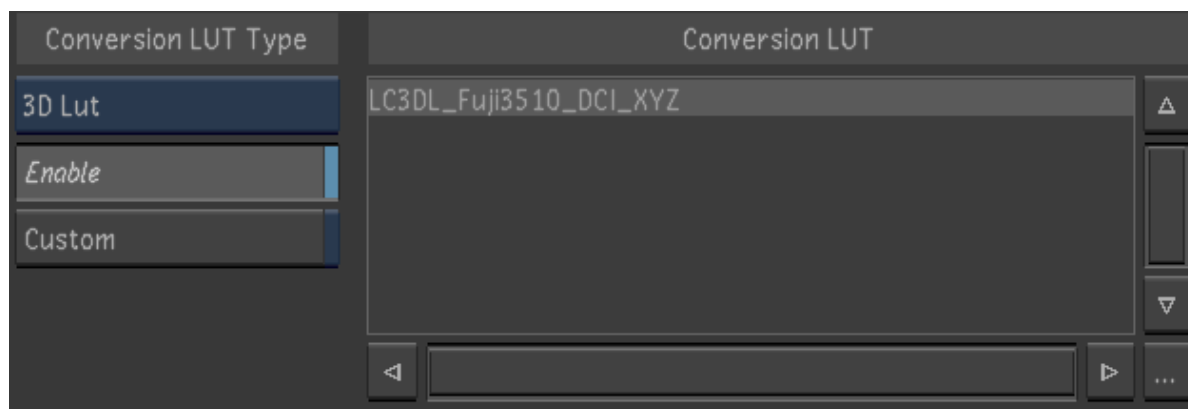
Curve Settings For more information on the curve settings, consult RED.

Transcode LUT Options Settings

From the Transcode / LUT Options menu, you can apply a LUT or colour transform on import to Gateway-imported media. Unlike [Input LUTs](#) (page 381), the processing is performed in the Gateway rather than in Lustre.

NOTE If you are accessing media that was imported to a Smoke/Flame system with the Cache Source Media option enabled, that media is no longer considered Gateway media. It is seen by Lustre as managed media and hence the LUT and Resize on import options are not available. To work around this, you can perform a Flush Cache Media operation in Smoke / Flame, prior to importing in Lustre.

The LUT Options menu contains the following options:



Conversion LUT Type box Use to select the LUT Type you want to apply. Options are:

- 1D LUT
- 3D LUT
- Colour Transform

Enable button Activate to apply the selected LUT or colour transform.

Custom button Activate to build and apply a custom colour transform. See [Creating a Custom Colour Transform](#) (page 226).

Conversion LUT list Click to select a LUT or colour transform to apply. Click again to deselect. This list is empty until you import LUTs or colour transforms using the Browse (...) button at the lower right. To remove an item from the list, select it and press the Delete key.

NOTE If you apply a colour transform that outputs floating-point data, the float conversion LUT is automatically applied after. See [Working with Half Float Media](#) (page 392).

Applying Colour Management on Import

From the Image / Transcode / LUT Options menu, you can manually apply a LUT or colour transform to media imported using the Wiretap Gateway. Or you can select the Auto Convert option to automatically apply the appropriate transformations, as specified in the current Input rules, as well as simply tagging your media to define its colour space without actually changing the pixels, leaving your sources unmodified.

NOTE If you are accessing media that was imported to a Smoke/Flame system with the Cache Source Media option enabled, that media is no longer considered Gateway media. It is seen by Lustre as managed media and hence the LUT and Resize on import options are not available. To work around this, you can perform a Flush Cache Media operation in Smoke / Flame, prior to importing in Lustre.

Applying a LUT or Colour Transform

- 1 From the Conversion LUT Type box, select 1D Lut, 3D Lut or Colour Transform.
- 2 Click Enable.

- 3 Select an item from the list, or click the Browse (...) button to locate and select a different LUT or colour transform. File paths are:

■ **1D LUTs:** /opt/Autodesk/project/<project_name>/lut/

NOTE The Wiretap Gateway supports Flame-compatible 1D LUT files only. Lustre-compatible 1D LUT files are not supported.

■ **3D LUTs:**

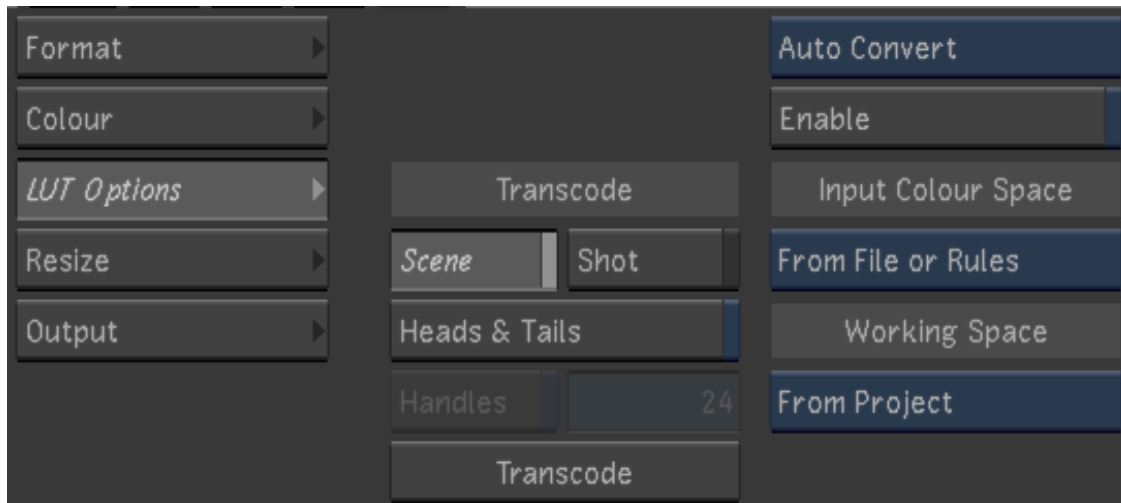
■ **Flame Premium:** /opt/Autodesk/project/<project_name>/lut/Lustre_Color_3DLUTs/

■ **Lustre Standalone:** /opt/Autodesk/Lustre_Color/lut/Lustre_Color_3DLUTs/

■ **Colour Transforms:** Click the Bookmark field to switch between the **Project**, **Shared**, and **Autodesk** locations. See [Colour Management Files and Locations](#) and [Autodesk Colour Transform Categories](#).

In addition to native .ctf files, you can also select files in several other supported LUT and transform formats.

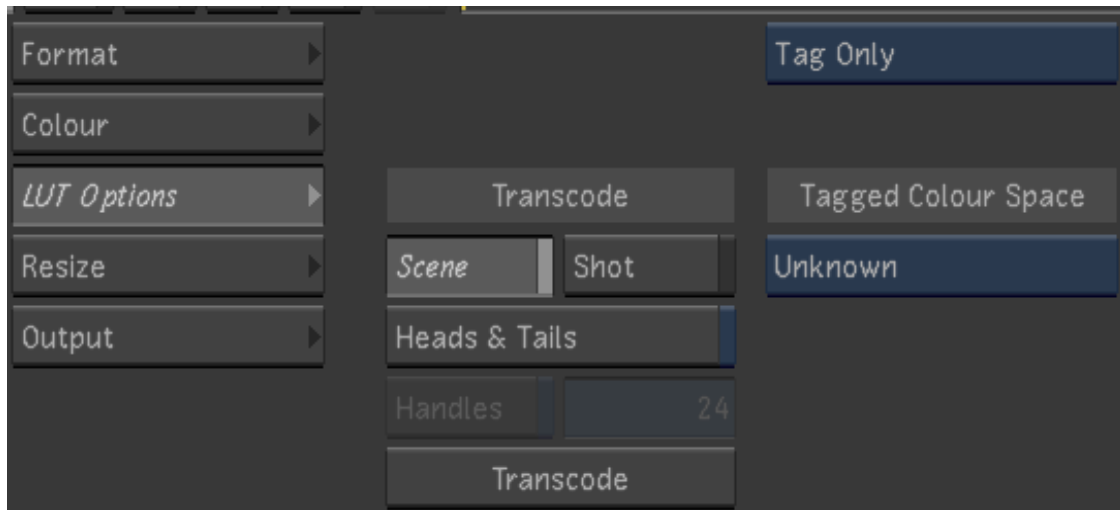
Using Auto Convert



Auto Convert: This option lets you to select the Input and the Working spaces and then converts the pixels from the Input Space to the Working Space. Images are tagged as being in the Working Space.

From File or Rules: When using the Auto Convert colour management mode, you can manually select an Input Colour Space or you can select From File or Rules. What this does is analyze in the media file for a readable colour space, if none is found, it defaults to the current Input Rules and uses the first rule that matches the media.

Using Tag Only



Tag Only: This option lets you set the Colour Space tagging metadata for clips but does not modify the pixels.

NOTE When importing content from Wiretap server, the tagged Colour Space metadata from Flame is displayed in this menu and can be modified if required.

Creating a Custom Colour Transform

You can create and apply a custom colour transform that is applied on import from the Image / Transcode / LUT Options menu. In addition, you can create and apply a custom colour transform that is applied when rendering from the Render / Output menu.

- 1 From the LUT Type box, select Colour Transform.
- 2 Click Enable.
- 3 Click Custom.
- 4 Click Add to insert an empty row.
- 5 Click the Type button and select a type:
 - **Shared:** The default location for shared custom colour transforms (available to all applications that use Autodesk Colour Management).
 - **Project:** The project transform folder (saved with the project).
 - **Autodesk:** The default location for preset colour transforms supplied with the application. See [Autodesk Colour Transform Categories](#).
 - **Import:** Browse for colour transforms on your file system.
- 6 After you've selected a colour transform type, click the Transform button and select a transform. In addition to native .ctf files, you can also select files in several other supported LUT and transform formats.

Information is displayed about the transform and the operations it contains.
- 7 To add more transforms to the end of the chain, repeat steps 4 to 6.

You can also:

 - Select a row and click the Type or Transform buttons again to change a transform in the chain.
 - Select a row and mute the current transform using Shift+M.

- Select a row and click Delete to remove a transform from the chain.
- Use the Up or Down buttons to reorder the chain. Moving a transform up applies it earlier in the chain, and moving it down applies it later.
- Activate the Invert button to invert the entire chain, that is, to convert from the original destination back to the original source.

NOTE Some colour transforms are impossible to invert perfectly. This happens when they map multiple input colours to the same output colour, such as when transforming from a large space to a smaller space. It is analogous to the fact that you cannot convert from a 12-bit signal to 8 bits and back to 12 bits again without data loss. In these situations, the Invert option maps the original output colour back to one of the original input colours, but applying the forward transform followed by the inverse transform will inevitably change some colours.

All transforms in the list are applied. The highlighted row indicates which transform will be affected by Up, Down, and other buttons. Information about the highlighted transform also appears in the metadata panel.

Exporting a Custom Colour Transform

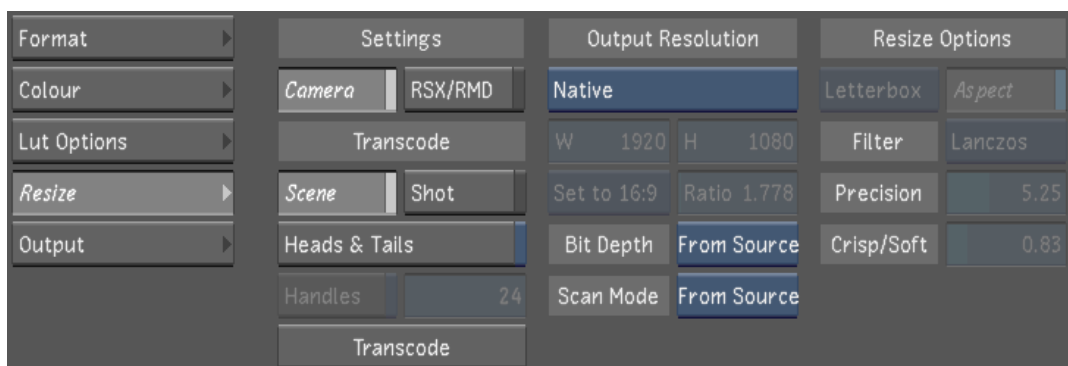
Once you are satisfied with your custom colour transform, you can export it to file and recall it for later use.

- 1 Create a custom colour transform. See [Creating a Custom Colour Transform](#) (page 226).
- 2 Click Export.
The file browser appears.
- 3 Click the Bookmark field to select the destination location:
 - To store the transform with the project for archiving, save it to the Flame **Project** location (opt/Autodesk/<project>/synColor/transforms).
 - To make the transform available to other applications that use Autodesk Colour Management, save it to the **Shared** location. This location is stored in the synColor configuration file and can be set in the Flame LUT preferences. The default location is /opt/Autodesk/Synergy/SynColor/Shared/transforms.
 - Saving transforms to the **Autodesk** location is not recommended
- 4 Enter a file name.
You can also enter a nickname and description. This information is included in the metadata that is displayed in the Description box in the Lut Options menu.
- 5 Click Export.

Transcode Resize Options

From the Image / Transcode / Resize menu, you can apply a resize to Wiretap Gateway imported media, without the need to transcode the media. The Resize is dynamically applied to the imported media. Adjust the resize values to define the destination resolution and the framing of the imported media.

NOTE If you are accessing media that was imported to a Smoke/Flame system with the Cache Source Media option enabled, that media is no longer considered Gateway media. It is seen by Lustre as managed media and hence the LUT and Resize on import options are not available. To work around this, you can perform a Flush Cache Media operation in Smoke / Flame, prior to importing in Lustre.



Output Resolution: Use to define the output resolution, aspect ratio, bit depth and scan mode of the transcoded media.

Resolution Field: Use to set custom resolution values.

Aspect Ratio Field: Select from a list of preset aspect ratios or set your own value.

Bit Depth Field: Use to define the bit depth of transcoded media.

Scan Mode Field: Use to define the scan mode of transcoded media.

Resize Options: Use to define the Fit Method, Resize Filter type, the Precision and the Crispness/Softness of the transcoded media.

Fit Method Box: Use to select the Fit Method applied to transcoded media. Options are:

- Fill (the default option)
- Crop Edges
- Letterbox
- Center/Crop

Resize Filter Type Box: Use to select the Resize Filter type applied to transcoded media. Options are:

- Impulse
- Triangle
- Mitchell
- Bicubic
- Quadratic
- Gaussian
- Shannon
- Lanczos

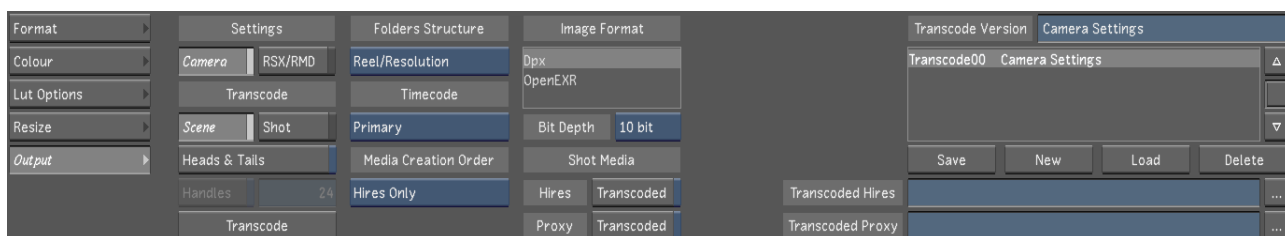
Aspect Button: Enable to use non-square pixel formats. This option is automatically enabled when Fit Method is set to Crop Edges or Letterbox.

Precision Field: Use to set the frequency cut-off point used during the Resize.

Crisp/Soft Field: Use to set the amount of blur used during the Resize.

Transcode Output Settings

transcode:output settings Use the Output settings to set an output destination for your transcode job and to change how the timecode is used.



For information on the Settings and Transcode options, see [Transcode Options](#) (page 218).

Folders Structure option box Defines how the transcoded media is organized on the storage.

Select:	To:
Reel/Resolution	Establish a <reel name>/<resolution> folder structure. This is the default option.
Reel/Shot/Resolution	Establish a <reel name>/<file name>/<resolution> folder structure.

Timecode option box Select which RED media timecode to transcode. Note that when conforming an EDL, overriding the timecode data of the clips with a different timecode track will prevent relinking in the Autodesk Visual Effects and Finishing applications.

Select:	To:
Primary	Select either the Time of Day or Edgecode timecode. Only select this option if you know which timecode has been set as the primary.
Time of Day	Establish a timecode field that is set by the internal clock from the RED camera.
Edgecode	Establish a timecode field that is set by the camera operator.

Media Creation Order option box Defines the high-resolution and proxy media transcoding order.

Select:	To:
Proxy/Hires	Transcode the proxy media for all the shots first, and then the high-resolution media is transcoded.
Hires/Proxy	Transcode the high-resolution media for all the shots first, and then transcode the proxy media.
Hires only	Transcode only the high-resolution media. This is the default and recommended media creation option. This allows you to work on the native proxy as the high resolution is transcoded.
Proxy only	Transcode only the proxy media.

Image Format list Select the type of file you want the RED footage to be transcoded to.

- Dpx
- OpenEXR

Bit Depth option box Select the bit depth to transcode your RED media to. The default is 10 bit.

Shot Media Hires/Proxy Transcoded button

Enable to view the Hires/Proxy transcoded media and disable to view the original RED media.

Transcoded Hires/Proxy fields Enter, or browse to, the location of the transcoded RED media directory. This directory must be an existing directory that is located on either a Wiretap server or a Wiretap Gateway. For Linux workstations, use the backward slash.

NOTE The Folders Structure, Media Creation Order, and Image Format options are not applied if you are transcoding to the Wiretap server.

Transcode Versioning box

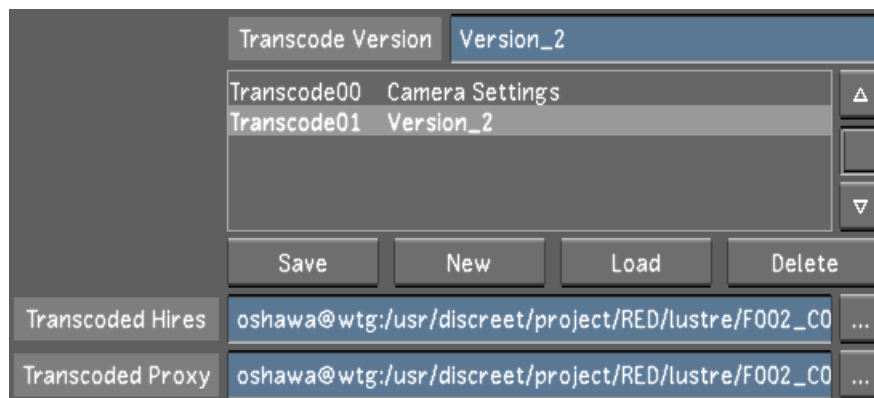
Use to save, update, load and delete Transcode versions to apply to your media. See Transcoding Versions.

Transcode to:	Type:
Wiretap Server	<server_name>@wt:/stonefs/Test_transcode/Transcode
Wiretap Gateway	<server_name>@wtg:/mnt/md0/transcode

Transcode Versioning

You can create and store multiple transcode settings for any given RED/ARRIRAW source. All of the transcode settings and their versions are stored in the Library source clip. Because the settings are stored in the Library source clip, you can update the transcode settings in a shot and share those settings with all shots originating from the same source clip. Each shot is still free to use its own version of the transcode settings. You can also share the transcoded media with other timelines that use the same shot, eliminating the need to transcode footage that has already been transcoded.

You can use the Transcode Version box to create, update, load and delete transcode versions.



To create a transcode version

- 1 Select a shot from your storyboard.
- 2 Type a name for your transcode version in the Comment field.
- 3 Click the New button.
- 4 Adjust your transcode settings.
- 5 Click the Save button.

NOTE

- You must click New before you start editing the settings, otherwise you will be editing the currently selected Transcode version.
 - The default version of the transcode settings is labeled "Transcode00 Camera Settings". These settings are from the camera, as stored in the metadata of the R3D/ARRIRAW file. These settings can be recalled at any time by enabling the Camera button.
-

To load a Transcode version

- 1 Select a shot from your storyboard.
- 2 Select a Transcode version from the list.
- 3 Press the Load button.

To update a Transcode version

- 1 Select a shot from your storyboard.
- 2 Select a Transcode version from the list.
- 3 Adjust your Transcode settings.
- 4 Click the Save button.

NOTE When you modify the transcode settings of a shot, all shots originating from the same source clip are updated with the new settings and the changes will immediately be visible on all shots sharing the updated transcode settings.

To delete a Transcode version

- 1 Select a Transcode version from the list.
- 2 Click the Delete button.

Transcoding Template

transcode:templateYou can save multiple transcode versions in a transcoding template. Once all settings have been established for your different transcoding versions, you can choose to save these settings as a template.You can create, load or delete a transcoding template.

Creating a New Transcoding Template

When you are working on a RED/ARRIRAW media project, you may want to apply the same transcoding settings to new footage as you import them. Being able to apply the settings from a previous session can ease the transcoding process.

There are two ways to create a new template:

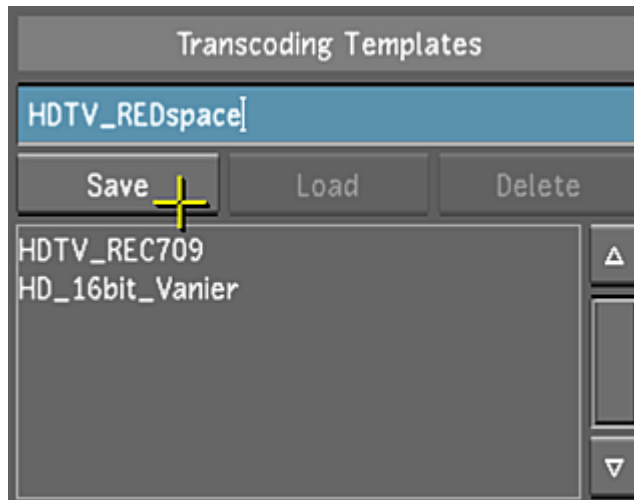
- By setting the values, saving your transcode versions and saving a new template.
- By loading a previously-saved template, making the necessary changes to the settings, and saving the new template.

To create a new transcoding template:

- 1 Set the values and save your transcode versions.

- 2 In the Transcoding Template field, enter a name and click Save.

NOTE You should enter a name that will help you distinguish what type of settings you have selected.



To create a new transcoding template from an existing template:

- 1 From the Transcoding Template list, select the template to use as baseline.
- 2 Click Load.

WARNING Rename the new template, or you will overwrite the original template with the new settings.

- 3 Click Save.

Your template is saved.

Loading a Transcoding Template

To load a transcoding template:

- 1 From the Transcoding Template list, select the template you want to apply.
- 2 Click Load.

Your template is loaded.

Deleting a Transcoding Template

To delete a transcoding template:

- 1 Select the template you want to remove from the Transcoding Template list.
- 2 Click Delete and then confirm.

Your template is deleted.

Working with EDL, ALE, and Cutlist Files

CDL files:Cutlist files:assemblingALE files:assemblingassembling:EDLs, ALE and Cutlist filesEDL files:assemblingYou can automatically recreate a timeline as it was edited during the offline editing stage of post-production provided you have all the source footage that was used, and a CMX3600-formatted EDL, ALE, or Cutlist file that describes how the source footage is arranged in the timeline. The process of rebuilding the timeline is called *assembling*.

When Lustre loads an EDL, ALE, or Cutlist file, it builds the timeline based on the following information:

- Source In/Source Out timecode or Record In/Record Out timecode.
- Tape/reel name. If the Use Reel Name button is enabled, Lustre verifies that the sources come from the correct tape. The tape name is part of the file path, and is always located one level above the resolution directory. For example, if the source files are located in *.../Scans/myclip/001/2058x1556/...*, then the tape name is 001.
- Source table. The source table enables the support of EDL reel names longer than eight characters.
- Dissolves. When Lustre finds a dissolve in the EDL, ALE, or Cutlist file, it places a dissolve of the specified duration at the appropriate transition.
- Speed changes. When a speed change is encountered in an EDL, ALE, or Cutlist file, the speed of the appropriate event is adjusted in the timeline using the Retime option.

To assemble an EDL, ALE, or Cutlist file, the system matches shot timecode values to source timecode in the EDL, ALE, or Cutlist file. Shot timecode values can be interpreted using two methods:

- By reading the timecode from the DPX file header. This method is intended for file formats (such as DPX files) that can contain embedded timecode values in the file header.
- By converting the shot's filename into timecode. The filename is established during the film scanning process.

The following table illustrates how a filename is converted into timecode.

Filename	Timecode 25 fps
00000.dpx	00:00:00:00
00024.dpx	00:00:00:24

Filename	Timecode 25 fps
00025.dpx	00:00:01:00
00060.dpx	00:00:02:10
00600.dpx	00:00:24:00
06000.dpx	00:04:00:00
06001.dpx	00:04:00:01

EDL Display and Functionality

EDL files:EDL display and functionalityWhen you load an EDL, ALE, or Cutlist file, its events appear in the Assembly window, located in the upper-left portion of the interface.

a

Show EDL

Show TL

Select All

Unselect All

Mark For Capture

Mark For Match

Delete Selected

Delete All

Slip

Ripple Rec

b

Event	Reel Name	Transition	Source In	Source Out	Record In	Record Out	KeyCode Start	KeyCode End	Media
1	REEL01	Cut	00:00:00:01	00:00:00:02	00:00:00:00	00:00:00:01			Linked
2	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:00:01	00:00:05:08			Linked
3	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:05:08	00:00:10:15			Linked
4	REEL01	Cut	00:00:00:01	00:00:01:11	00:00:10:15	00:00:12:00			Linked
5	REEL01	Cut	00:00:00:01	00:00:02:19	00:00:12:00	00:00:14:18			Linked
6	REEL01	Cut	00:00:00:01	00:00:01:06	00:00:14:18	00:00:15:23			Linked
7	REEL01	Cut	00:00:00:01	00:00:01:06	00:00:15:23	00:00:17:03			Linked
8	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:17:03	00:00:22:10			Linked
9	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:22:10	00:00:27:17			Linked
10	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:27:17	00:00:32:24			Linked
11	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:32:24	00:00:38:06			Linked
12	REEL01	Cut	00:00:05:07	00:00:05:08	00:00:38:06	00:00:38:07			Linked
13	REEL01	Cut	00:00:03:20	00:00:03:21	00:00:38:07	00:00:38:08			Linked
14	REEL01	Cut	00:00:00:01	00:00:00:02	00:00:38:08	00:00:38:09			Linked
15	REEL01	Cut	00:00:00:01	00:01:40:01	00:00:38:09	00:02:18:09			Linked
16	REEL01	Cut	00:00:00:02	00:00:00:03	00:02:18:09	00:02:18:10			Linked
17	REEL01	Cut	00:00:00:01	00:00:00:05	00:02:18:10	00:02:18:14			Linked
18	REEL01	Cut	09:36:00:00	09:36:00:04	00:02:18:14	00:02:18:18			Need Match

(a) EDL event buttons (b) EDL events

TIP Clicking a header will sort the EDL according to the selected data type.

Use the following buttons to facilitate EDL event management.

Click:	To:
Show EDL	View the currently loaded EDL.
Show TL	View timeline shot information. In order to display shot information for the currently loaded EDL, you must first assemble it.

Click:	To:
Select All	Select everything in the EDL event list.
Unselect All	Deselect all selected events.
Mark For Capture	Flag the currently selected event for capture. See Metadata Maintained for Missing Shots (page 247).
Mark For Match	Flag the currently selected event to be matched to a shot in the Library.
Delete Selected	Delete selected events. NOTE This button is only functional when the timeline is not displayed.
Delete All	Delete all events. NOTE This button is only functional when the timeline is not displayed.
Slip	Offset the shot's Source In/Out or Record In/Out timecodes without affecting the length of the shot. If you offset the Source In timecode, the Source Out timecode will be adjusted automatically, and vice versa. The same applies to Record In and Record Out timecodes.
Ripple Rec	Apply modifications made to a shot's Source In timecode to the Record Out timecodes for all subsequent events in the EDL.

EDL and Keycode Assembly Workflow

keycode:assembly workflowworkflows:EDL and keycode assemblyEDL files:assembly workflowThe recommended steps for EDL or Keycode assembly are as follows.

Step:	Refer to:
1. Access the file browser.	Accessing the File Browser (page 203).
2. Load shots into the Library.	Loading Clips to the Library (page 212).
3. Add CDL data to an EDL file to associate CDL data to individual events (shots).	Adding CDL Data to an EDL File (page 236).
4. Copy the EDL into Lustre.	Importing an EDL, ALE, or Cutlist File (page 237).
5. Assemble the EDL to automatically build your footage into a timeline.	Assembling an EDL (page 240).
6. Optional: Trim or edit the shots in the timeline as needed. If you perform this step, you may have to export the timeline as an EDL.	Editing (page 257), and Exporting Shots to an EDL (page 245).

Step:	Refer to:
7. Save the assembled EDL as a cut.	Creating a New Cut (page 102).

Example of a Possible CDL Workflow

CDL:example workflowTo facilitate the transfer of colour intent from the production to the post-production world, many productions do on-set grading. This means that simple colour grading is done at the same time as production. Here is a simplified sequence of events explaining the process:

- Production is shooting content on film or digital.
- Film is processed.
- Film is scanned.
- DPX files are copied to FireWire® drive for production.
- Colourist on set uses third party application to grade DPX.
- CDL data is created (as EDL comment or XML files).
- Post facility receives CDL and starts dailies grading/preview or DI based on CDL (on-set) intention.
- Offline editorial receives dailies for editorial.
- EDL are generated for conform.
- Colour grading process starts.

Adding CDL Data to an EDL File

CDL:adding data to EDL fileYou can add CDL data to an EDL file either inline (CDL slope, offset, and power data embedded directly in the EDL), or through an XML reference.

An XML reference can be either a .ccc or .cdl file; both have one single XML file with multiple shot information. However, Lustre will only read the first SOP grouping (data for a single shot) of colour correction from either of these files. Therefore, users must have one XML file for each event.

The CDL specification defines CMX EDL comments as the transport mechanism. CDL data can be expressed as EDL data with the CDL values or as an XML file.

Storing Inline CDL Parameters as Notes in an EDL File

Add CDL data directly to an EDL file to transport simple primary grading data to the Lustre colour grading application.

The ASC_SOP note associates all nine ASC CDL colour values with the edit that precedes the note. The first three numbers are the R, G, and B values of the slope parameter. The second three numbers are the RGB values for offset. And, the last three numbers pertain to the RGB values for the power parameter.

Each parameter's three values are grouped by parentheses, and a space will separate the grouped parameters from each other and the Note ID string ("*ASC_SOP"). This note limits the parameter values to five digits of precision. This allows all nine parameters to fit into one 80- column note. An example of the inline CDL data added to the EDL file is as follows.

Each of the numbers that represents a colour value of a parameter should be in the form of a two to five digit number with a decimal point placed anywhere between the most and least significant digits (for example, from 0.0 or 0.0001 to 9999.9). This prevents the decimal from being missed or misinterpreted. The numbers that represent the offset parameters may have an optional leading minus sign. There is a leading

space at the head of each number, except for the first value of each parameter (the Red value), which has a leading left parenthesis instead. The last value of each parameter (the Blue value) has a trailing right parenthesis. There is a space between the NOTE ID String ("*ASC_SOP") and the first left parenthesis.

To manually add CDL data to an EDL file (inline method):

- 1 Open your EDL file in a text editor.
- 2 Open the file with raw CDL data.
- 3 In the CDL data file, copy the SOP information for the first shot.
- 4 In the EDL file, enter the CDL data in a new line after the line identifying the clip name.

NOTE Make sure you begin the new line with the *ASC_SOP note ID.

- 5 Perform this procedure for each shot for which you have CDL data.

Storing CDL Parameter References to ASC CDL XML Files or ASC CCC XML Files

The ASC_CC_XML note begins with the '*ASC_CC_XML' note ID string and is followed by the file name that associates that shot with a unique XML file. This XML file follows the XML implementation of the ASC CDL. An example of the reference line added to the EDL file is as follows.

```
010 216R05 V C 05:40:12:18 05:40:14:09 01:00:29:16
01:00:31:07
FROM CLIP NAME: 0054
*ASC_CC_XML cc1009
```

NOTE In the previous example, the reference to 'cc1009' is a reference to the XML file cc1009.cdl (if it's a CDL XML file), or cc1009.ccc (if it's a CCC XML file).

NOTE The reference to the XML file must not include the '.cdl' or '.ccc' suffixes in the EDL file.

WARNING If you use both CDL and CCC files, make sure you do not assign the same name for any CDL file to a CCC file. If Lustre finds a CDL file with the name that is referenced in the EDL file, it will only read the CDL file, even if a CCC file with the same name exists.

To manually add CDL or CCC file references to an EDL file:

- 1 Open your EDL file.
- 2 In the EDL file, find the shot information for the shot corresponding to the XML file you wish to reference.
- 3 Enter the XML file reference information corresponding to the shot in a new line after the line identifying the clip name.

NOTE Make sure you begin the new line with the *ASC_CC_XML note ID.

- 4 Perform this procedure for each shot for which you have a corresponding XML file (either a *.cdl or *.ccc file).

Importing an EDL, ALE, or Cutlist File

copying:EDL, ALE, and Cutlist files into Lustre;importing:EDL, ALE, and Cutlist filesCutlist files:copying into LustreALE files:copying into LustreEDL files:copying into LustreBefore you can assemble an EDL, ALE, or Cutlist file, you have to copy the file into the current scene's *Library* directory.

NOTE The file must have a *.edl, *.ale, or *.ctl file extension or it will not appear in the EDL list.

There are two ways to import EDLs into Lustre:

- Outside of Lustre, files can be copied manually to the *Library* directory of the current scene. If running the Windows version of Lustre, save the EDL to the *C:\Program Files\Autodesk\Lustre<version>\projects\<project_name>\Library* folder. If running the Linux version of Lustre, save EDLs in the */usr/autodesk/lustre_<version>/projects/<project name>/Library* directory.

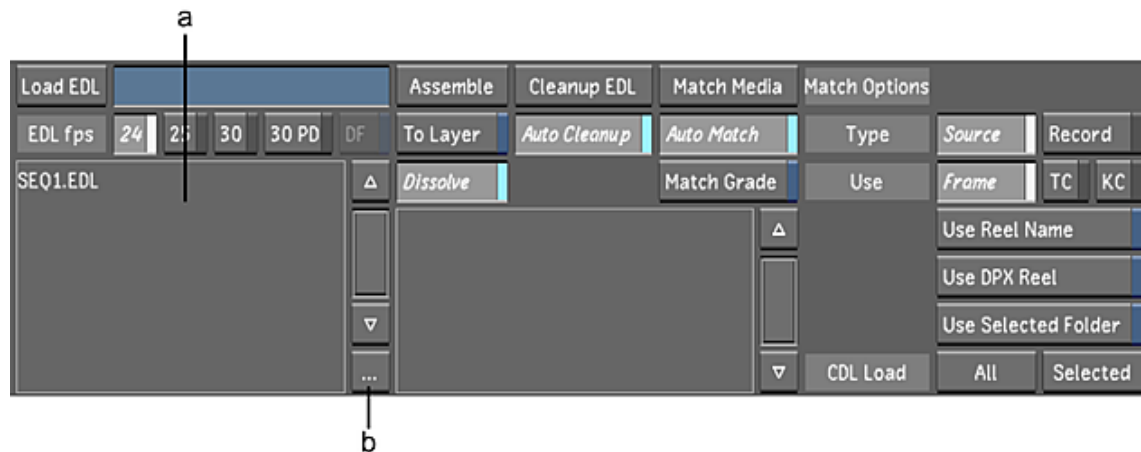
NOTE Press **Ctrl+R** to refresh the EDL list to see recently copied files.

- Within Lustre, copies of EDL files are imported using the Import file browser.

To import a copy of an EDL, ALE, or Cutlist file while in Lustre:

- 1 Select the Editing/Assemble menu.

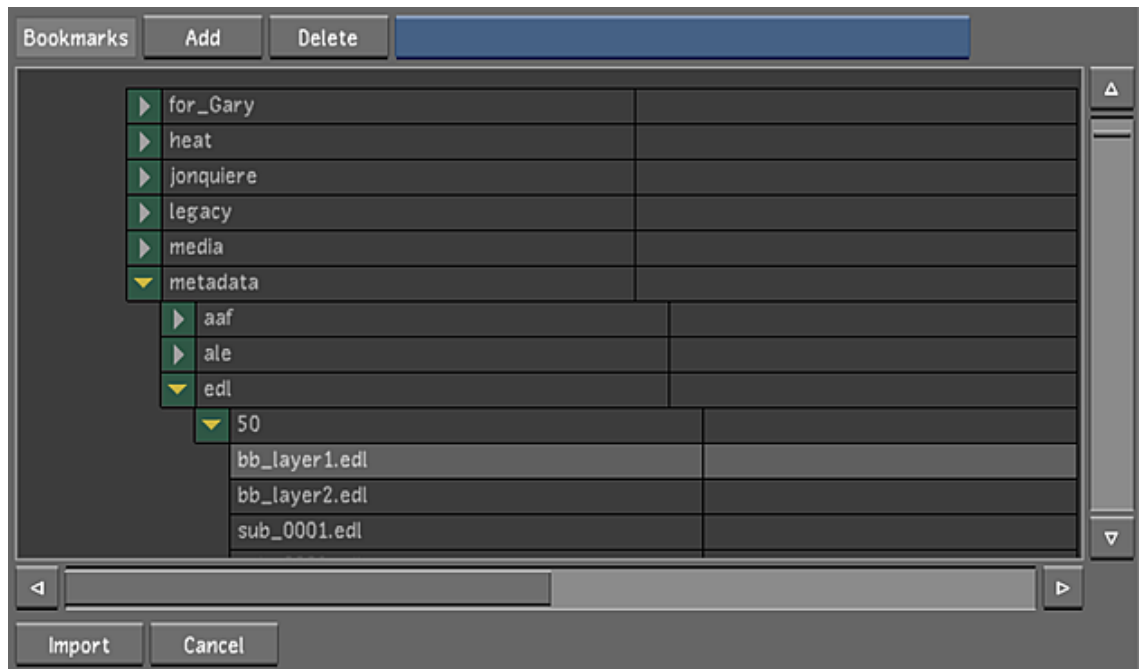
The Assemble options appear.



(a) EDL list (b) Browse button

- 2 In the EDL List, click the Browse button.

The Import file browser appears.



- 3 Navigate to the appropriate source folder and select one or more EDL files (You can also use [bookmarks](#) (page 210) to retain a list of folder locations). Traditional methods of multi-selecting (`Shift-click`, `Ctrl-click`) are enabled.
- 4 Click Import.

WARNING If an EDL with the same filename is already in the EDL list, the Import button will turn red. You must click again to confirm that you want to overwrite the file.

TIP If no files are selected, you can also press `Enter` to cancel file selection and close the Import file browser.

A copy of the file is imported into the *Library* folder, and appears in the EDL list.

Stereo 3D Data in EDL Conform

Many S3D production pipelines have a need to exchange S3D metadata, like convergence and Floating Window data. We provide the ability to insert such data in CMX EDL. The S3D data includes:

- * SDL_FWL: Floating Window Left
- * SDL_FWL: Floating Window Left
- * SDL_HIT: Convergence

Here are some examples:

■ **EDL comment without animation:**

* SDL_FWL: (126,0)

Explanation: The Floating Window Left value is set to 126 at frame 0.

* SDL_FWR: (119,0)

Explanation: The Floating Window Right value is set to 119 at frame 0.

* SDL_HIT: (7,0)

Explanation: The Convergence value is set to 7 at frame 0.

■ **EDL comment with animation:**

* SDL_FWL: (126,0) (146,19)

Explanation: The Floating Window Left value is set to 126 at keyframe 0 and to 146 at keyframe 19.

* SDL_FWR: (119,0) (162,19)

Explanation: The Floating Window Right value is set to 119 at keyframe 0 and to 162 at keyframe 19.

* SDL_HIT: (7,0) (31,13) (0,21) (35,29)

Explanation: The Convergence value is set to 7 at frame 0, to 31 at keyframe 13, to 0 at keyframe 21, and to 35 at keyframe 29.

NOTE This data can also be natively imported to Smoke or Flame and can be imported to Luster in a Wiretap Interoperability Workflow.

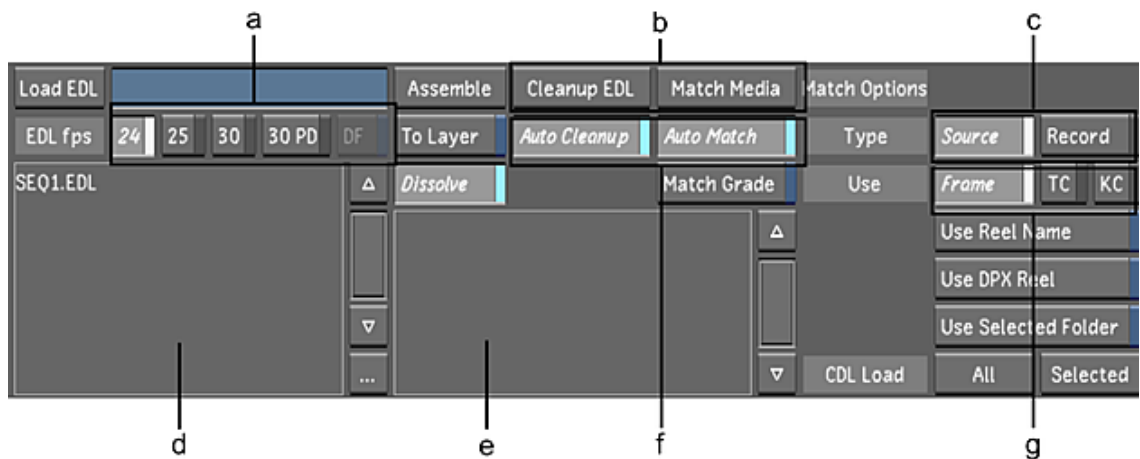
- S3D data can be exported to EDL, by enabling the Use SDL button, in the Editing / Browse menu.

Assembling an EDL

assembling:EDL filesEDL files:assemblingUse an EDL to rebuild a timeline using original source footage that matches the edited timeline from the offline editing stage of post-production. It is also possible to add the assembled EDL to a new layer of the current timeline.

To assemble an EDL:

- 1 Load the shots that you want to assemble into the Library.
- 2 Click Editing, and then click Assemble.
The Assemble menu appears.



(a) Frame Rate buttons (b) Manual options (c) Base of assembly buttons (d) EDL list (e) Log window (f) Assemble options (g) Timecode buttons

- 3 (Optional) Import an EDL into the EDL list. See [Importing an EDL, ALE, or Cutlist File](#) (page 237).
- 4 Select the EDL you want to load from the EDL list.
- 5 Determine the base of assembly by enabling one of the following.
Source Recreates a timeline according to how the source footage was arranged.
Record Assembles the timeline using the timecode of the final edited clip.

NOTE If you selected Record as your base of assembly and your shots include dissolves, enable First-Last Key Anim Type on the Setup page of the Animation menu. See [Synchronizing Keyframe Functionality](#) (page 559).

- 6 Click the Frame Rate button that corresponds to your EDL's frame rate. The following frame rates are supported.

Enable:	To:
24	Load a 23.98 or 24 fps EDL.
25	Load a 25 fps (PAL) EDL.
30	Load a 29.97 or 30 fps (NTSC) EDL.
30 PD	Convert an NTSC EDL to 24 fps and load the converted EDL.
DF	Load a 29.97 fps drop frame mode (NTSC) EDL.

- 7 Enable Match Name to match the timecode and tape name in the EDL to your shots.
Lustre tries to detect the Tape name in the EDL to the shots' directory path. This path is fixed—the correct directory should be one level above the resolution directory. For example, if the tape name in the EDL is BTE164, the matching shot is at:

<HOME>\scans\BTE164\2048x1556\0002487.dpx

TIP To match the EDL reelname to the reelname in the DPX header, enable the Use Reel Name button in the System & Menu page of the user configuration. See [System & Menu Settings](#) (page 88).

- 8 Enable Dissolve to include any dissolves in the EDL.

NOTE Only dissolve transitions are supported when loading an EDL. Other transitions are replaced by cuts.

WARNING Continuing this process creates a new cut from the EDL. If you have not saved your work, it will be lost. Therefore, it is a good idea to start from an empty cut before loading an EDL.

- 9 Enable either Frame or Timecode depending on how you want Lustre to read the shot's timecode when assembling the EDL.

- Enable Frame to convert the shot filename to a timecode value.
- Enable Timecode to use the timecode value stored in the file header.

NOTE For information on Keycode assembly, see [Keycode Assembly](#) (page 245).

- 10 Click Load EDL.

The system checks to make sure that the EDL is a valid CMX3600-formatted EDL. If the EDL is not valid, a message appears in the Load log and the EDL is not loaded.

NOTE ALE and Cutlist files are also valid. See [Keycode Assembly](#) (page 245).

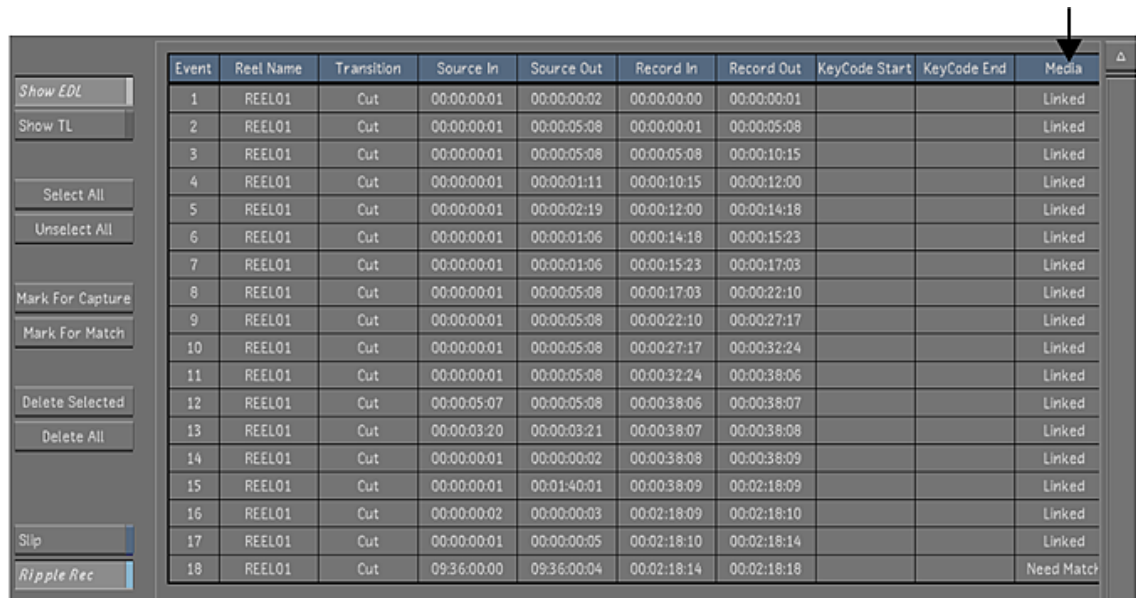
- 11 To perform an EDL cleanup, do one of the following:

- Click EDL Cleanup to perform cleanup prior to assembling.
- Enable Auto Cleanup to automatically perform cleanup during assembly.

When Lustre performs an EDL cleanup, it arranges EDL events according to record timecode and deletes problematic events. For example, if an EDL has two events with conflicting timecodes, the event with the lower number is deleted during cleanup.

- 12 To match EDL event timecodes to shot timecodes in the Library, do one of the following:
 - Click Match Media to match EDL event timecodes to available shot timecodes in the Library prior to assembling.
 - Enable Auto Match to automatically match EDL event timecodes to available shot timecodes in the Library during assembly.

The matching process links EDL event timecodes to media timecodes in the Library. The match status is indicated in the Media column of the Assembly window. Successful matches are indicated by a Linked status, whereas unsuccessful matches generate a Need Match status.



Event	Reel Name	Transition	Source In	Source Out	Record In	Record Out	KeyCode Start	KeyCode End	Media
1	REEL01	Cut	00:00:00:01	00:00:00:02	00:00:00:00	00:00:00:01			Linked
2	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:00:01	00:00:05:08			Linked
3	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:05:08	00:00:10:15			Linked
4	REEL01	Cut	00:00:00:01	00:00:01:11	00:00:10:15	00:00:12:00			Linked
5	REEL01	Cut	00:00:00:01	00:00:02:19	00:00:12:00	00:00:14:18			Linked
6	REEL01	Cut	00:00:00:01	00:00:01:06	00:00:14:18	00:00:15:23			Linked
7	REEL01	Cut	00:00:00:01	00:00:01:06	00:00:15:23	00:00:17:03			Linked
8	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:17:03	00:00:22:10			Linked
9	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:22:10	00:00:27:17			Linked
10	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:27:17	00:00:32:24			Linked
11	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:32:24	00:00:38:06			Linked
12	REEL01	Cut	00:00:05:07	00:00:05:08	00:00:38:06	00:00:38:07			Linked
13	REEL01	Cut	00:00:03:20	00:00:03:21	00:00:38:07	00:00:38:08			Linked
14	REEL01	Cut	00:00:00:01	00:00:00:02	00:00:38:08	00:00:38:09			Linked
15	REEL01	Cut	00:00:00:01	00:01:40:01	00:00:38:09	00:02:18:09			Linked
16	REEL01	Cut	00:00:00:02	00:00:00:03	00:02:18:09	00:02:18:10			Linked
17	REEL01	Cut	00:00:00:01	00:00:00:05	00:02:18:10	00:02:18:14			Linked
18	REEL01	Cut	09:36:00:00	09:36:00:04	00:02:18:14	00:02:18:18			Need Match

NOTE It is not necessary for all shots to be available prior to conforming. For example, shots with a Need Match status can be captured after the initial conform and assembled with the rest of the EDL later. In the meantime, media metadata will be maintained and black frames will be added where the shots would have appeared. You can also update shots after conforming. See [Metadata Maintained for Missing Shots](#) (page 247).

- 13 Enable or disable the To Layer depending on how you want to assemble the new cut.
 - Enable To Layer to assemble a cut to a new layer above the existing layer(s) in the currently loaded cut.
 - Disable To Layer to overwrite the currently loaded cut with the newly assembled cut.

- 14 Click Assemble to conform the EDL.

NOTE If a timeline has not been loaded, then a cut is automatically created with the same name as the EDL.

NOTE When a timecode gap occurs between EDL events, black frames are inserted between the events to fill the gap.

- 15 (Optional) To manually match shots in the Library to EDL events, use the Replace Shot tool to add the correct footage into the blank shots. See [Replacing Shots](#) (page 271).

After working on a previously assembled EDL, to ensure the same grading is applied to the newly assembled EDL, you need to apply the match grade option. See [Match Grade](#) (page 243).

NOTE You can also assemble an EDL with CDL data. See [Loading CDL Data in the EDL Panel](#) (page 251).

To assemble an EDL to the currently opened Timeline:

- 1 In the Editing menu, click Assemble.
- 2 Enable To Layer.
- 3 Load the EDL.

The EDL is now assembled to a new layer in the current Timeline.

NOTE The record timecode of the EDL is used as the in point when assembling an EDL to a layer of an existing Timeline.

To load the EDL as a new Timeline:

- 1 In the Editing menu, disable To Layer.
- 2 Load the EDL.

The EDL is loaded to a new Timeline. If there is already an existing cut, it replaces the current cut with the newly assembled EDL.

Match Grade

matching:grade settings with a new assembled timelinegrades:applying to a new assembled timelinematch grade:match optionsThe Match Grade feature allows you to apply current grade settings to a new assembled timeline without having to create a new cut file and use the Change Cut option. For information about the Change Cut option, see [Changing a Cut](#) (page 107).

When you enable Match Grade during a timeline assembly, the function applies the appropriate grade to any shots that are also included in the current cut. Match options are also available to allow you to specify the basis of the match.

To apply the current grade settings to a new assembled timeline:

- 1 Make sure a graded cut is already loaded into the timeline.
- 2 To specify the basis of the match, select one or more Match Options from the Browse menu.



UID Performs matching based on the shot's unique ID.

NOTE UIDs are regenerated every time a new cut file is created in Lustre.

Source Performs matching based on source data, such as a shot's source timecode, ID, and tape/reel name.

Record Performs matching based on record data, such as an EDL's record timecode.

Custom Performs matching based on the keyword that is selected in the custom list.

If the Custom option is enabled, there is a list of keywords to which you can associate the custom option.

Select:	To:
EDLReelName	Match the reel name of the EDL.
FolderReelName	Match the folder reel name.
DPXReelName	Match the DPX reel name.
DLEDClipName	Match the clip name of the shot coming from the Wiretap server.
DLEDOrgin	Match the image import path and file name of the timeline coming from the Wiretap server.
DLEDSourceId	Match the media source's unique ID of the timeline coming from the Wiretap server.
DLEDSegmentId	Match the segment's unique ID of the timeline coming from the Wiretap server.
DLEDStartTc	Match the start source timecode of the timeline coming from the Wiretap server.
DPXKeycodeStart	Match the DPX header keycode start.
DPXKeycodeEnd	Match the DPX header keycode end.
EDLComment	Match the unique comment that is applied to the original cut from another application.

- 3 In the Assemble menu, enable Match Grade.
- 4 Assemble the EDL, ALE, or CTL file.
- 5 Click Browse to display the Browse menu.
- 6 Save the new cut file.
- 7 Click Setup, and then click Grade to display the Grade menu.
- 8 Click New Version to save the grade with the newly associated cut.

When working with a multi-layer timeline and Solo mode is disabled, the layers are flattened and only the grade settings from the shots that are visible in the Storyboard are applied to the newly assembled timeline. When working with a multi-layer timeline and Solo mode is enabled, only the grade settings from the active layer are applied to the newly assembled timeline. If the new timeline has multiple layers, then the grade setting is applied to each layer.

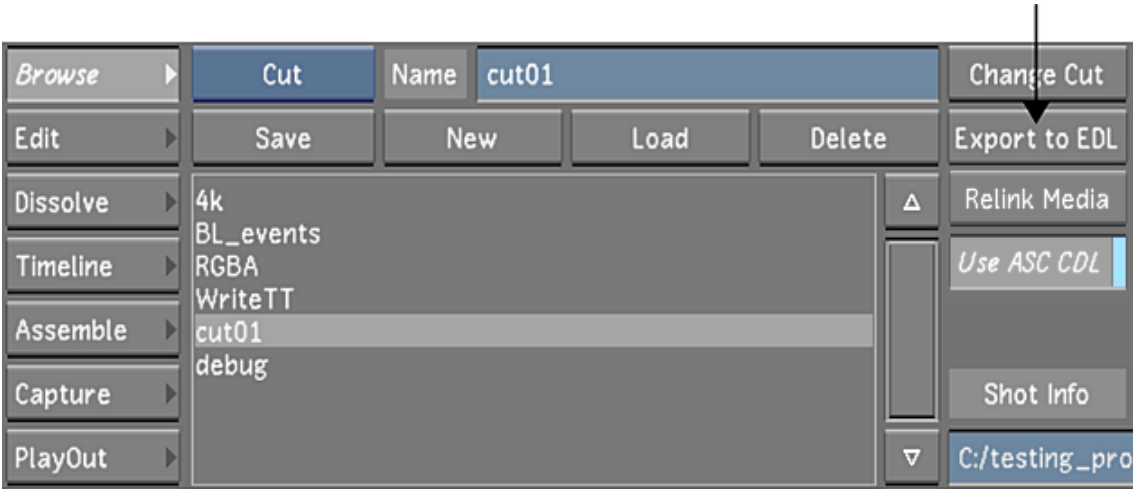
Exporting Shots to an EDL

exporting, EDL filesEDL files:exportingYou can export your cut file as a CMX3600 EDL. The exported EDL is saved with the name of the currently loaded cut, plus a *.edl file extension, and is placed in the scene's *Library* directory.

When exporting a multi-layer timeline and Solo mode is disabled, the layers are flattened and only the shots that are visible in the Storyboard are exported. When exporting a multi-layer timeline with Solo mode enabled, only the shots in the soloed layer are exported.

To export a timeline as an EDL:

- 1 Access the Editing/Browse menu.
- 2 If it is not already loaded, load the cut you want to export. See [Managing Cuts](#) (page 101).
- 3 Click Export to EDL.



A CMX3600 EDL is created from the shots in the current timeline and placed in the scene's *Library* directory.

Keycode Assembly

keycode:assemblyYou can load ALE (*.ale) and Cutlist files (*.ctl) as EDLs in the Assemble menu. Once loaded, you can use their keycode information for media assembly.

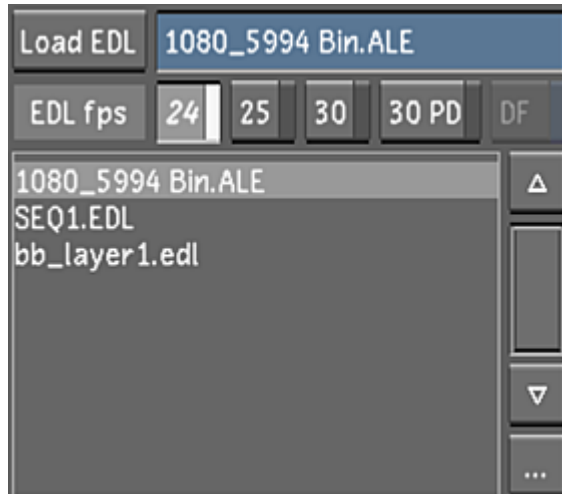
Most keycode types are fully supported in ALE and Cutlist file assembly. However, if Lustre encounters an unknown keycode type, it cannot parse its information. In these cases, add the missing keycode type name and value manually to the *init.config* file, located in *C:\Program Files\Autodesk\<version number>* on the Windows version of Lustre, or in */usr/autodesk/<version number>* on the Linux version of Lustre. For example, if the missing type is FN and the keycode value is 123456, you would enter the following in the *init.config* file:

FN 123456

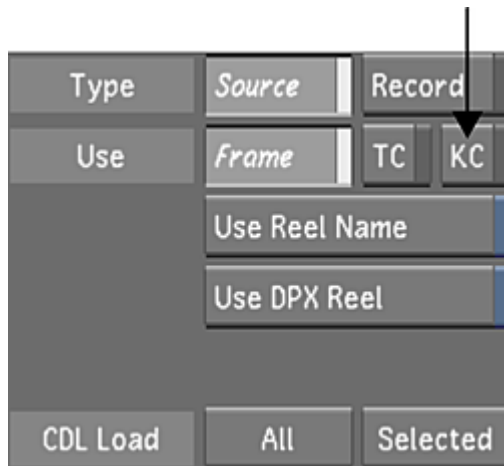
To load and assemble ALE and CTL files:

- 1 Load the shots that you want to assemble into the Library.
- 2 Click Editing, and then click Assemble.
- 3 (Optional) Import an EDL into the EDL list. See [Importing an EDL, ALE, or Cutlist File](#) (page 237).

- 4 Select the ALE or Cutlist file from the list.



- 5 Select the appropriate EDL Frame Rate.
- 6 Click KC to assemble media according to the file's keycode information.



- 7 Click Load EDL.
The system checks to make sure it is a valid ALE or Cutlist file. If not, the file is not loaded.
- 8 To perform a cleanup on the ALE or Cutlist file, do one of the following:
 - Click EDL Cleanup to perform the cleanup prior to assembling.
 - Enable Auto Cleanup to automatically perform cleanup during assembly.

When Lustre performs a cleanup on an ALE or Cutlist file, it arranges events according to record timecode and deletes problematic events. For example, if an ALE file has two events with conflicting timecodes, the event with the lower number is deleted during cleanup.
- 9 To match ALE or CTL event timecode/keycode to shot timecode/keycode in the Library, do one of the following:
 - Click Match Media to match event timecode/keycode to available shot timecode/keycode in the Library prior to assembling.
 - Enable Auto Match to automatically match event timecode/keycode to available shot timecode/keycode in the Library during assembly.

The match status is indicated in the Media column of the Assembly window. Successful matches are indicated by a Linked status, whereas unsuccessful matches generate a Need Match status.

NOTE It is not necessary for all shots to be available prior to conforming. See [Metadata Maintained for Missing Shots](#) (page 247).

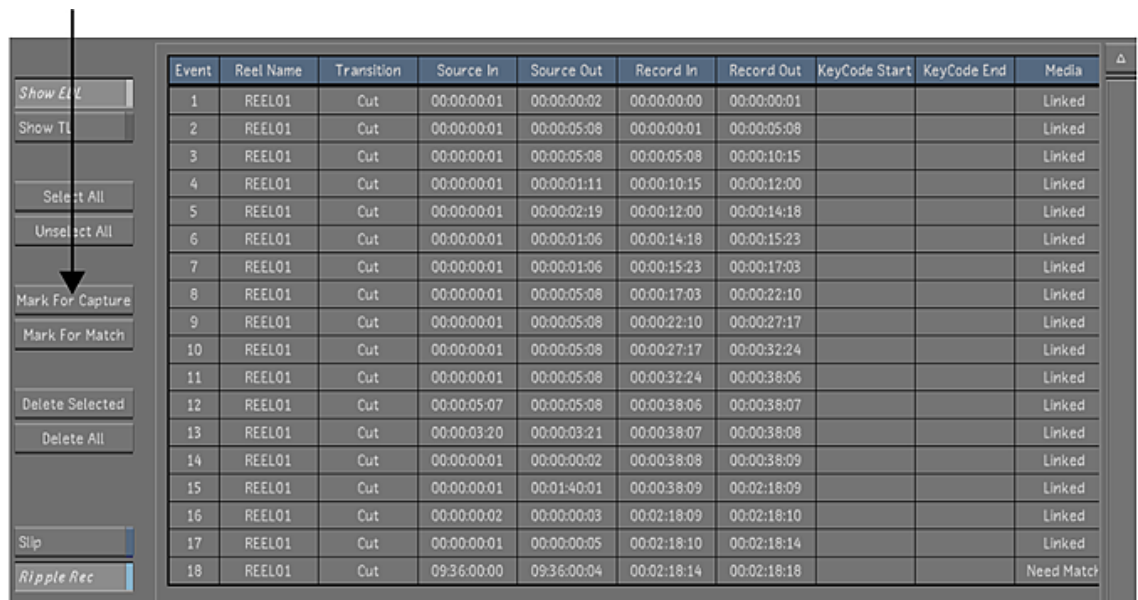
- 10 To manually match shots in the Library to ALE or CTL events, use the Replace Shot tool to add the correct footage into the blank shots. See [Replacing Shots](#) (page 271).
- 11 Click Assemble to conform the ALE or CTL file and build the cut.

Metadata Maintained for Missing Shots

Cutlist files: marking shots for later capture
 ALE files: marking shots for later capture
 EDL files: marking shots for later capture
 capturing: shots after the initial conform
 If certain shots in the EDL, ALE or Cutlist file are not yet available, or if you would like to update shots that are already linked to events with new shots, you can mark them for capture. Shots can be individually captured either before or after the initial conform. Metadata for missing shots will be maintained for inclusion at a later time, and black frames will be inserted in the timeline where the shot should be. In the meantime, work can begin on the available shots.

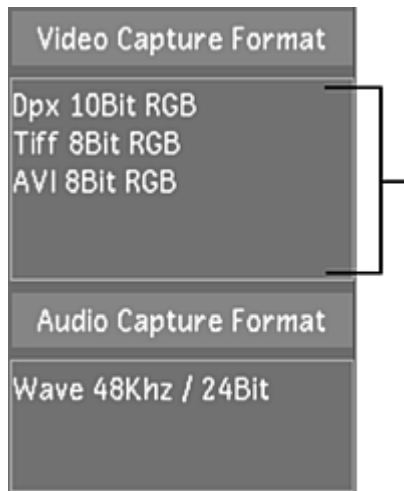
To mark missing shots for capture:

- 1 In the Editing menu, click Assemble to display the Assemble menu.
- 2 In the Assembly window, **Ctrl**-click each event to be marked for capture.
- 3 Click Mark For Capture.

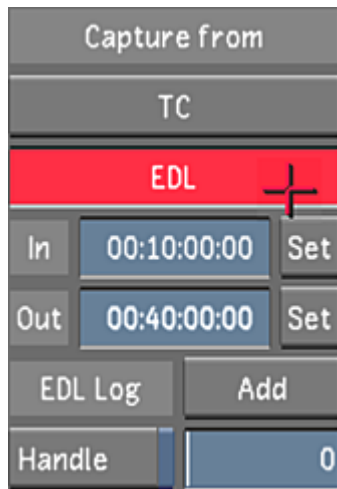


Event	Reel Name	Transition	Source In	Source Out	Record In	Record Out	KeyCode Start	KeyCode End	Media
1	REEL01	Cut	00:00:00:01	00:00:00:02	00:00:00:00	00:00:00:01			Linked
2	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:00:01	00:00:05:08			Linked
3	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:05:08	00:00:10:15			Linked
4	REEL01	Cut	00:00:00:01	00:00:01:11	00:00:10:15	00:00:12:00			Linked
5	REEL01	Cut	00:00:00:01	00:00:02:19	00:00:12:00	00:00:14:18			Linked
6	REEL01	Cut	00:00:00:01	00:00:01:06	00:00:14:18	00:00:15:23			Linked
7	REEL01	Cut	00:00:00:01	00:00:01:06	00:00:15:23	00:00:17:03			Linked
8	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:17:03	00:00:22:10			Linked
9	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:22:10	00:00:27:17			Linked
10	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:27:17	00:00:32:24			Linked
11	REEL01	Cut	00:00:00:01	00:00:05:08	00:00:32:24	00:00:38:06			Linked
12	REEL01	Cut	00:00:05:07	00:00:05:08	00:00:38:06	00:00:38:07			Linked
13	REEL01	Cut	00:00:03:20	00:00:03:21	00:00:38:07	00:00:38:08			Linked
14	REEL01	Cut	00:00:00:01	00:00:00:02	00:00:38:08	00:00:38:09			Linked
15	REEL01	Cut	00:00:00:01	00:01:40:01	00:00:38:09	00:02:18:09			Linked
16	REEL01	Cut	00:00:00:02	00:00:00:03	00:02:18:09	00:02:18:10			Linked
17	REEL01	Cut	00:00:00:01	00:00:00:05	00:02:18:10	00:02:18:14			Linked
18	REEL01	Cut	09:36:00:00	09:36:00:04	00:02:18:14	00:02:18:18			Need Match

- 4 In Editing, click Capture to display the Capture menu.
- 5 In the Capture Format group, select the video file format you want to create during the capture operation. See [Capture Menu Options](#) (page 639).



- 6 In the Naming group, enter values in the Capture, Tape, and Resolution fields.
- 7 Click EDL, and then confirm the action.



The capturing session begins.

The tape currently loaded in the VTR is ejected. You are prompted to enter the first tape needed in the EDL. Once you enter the tape, Lustre begins capturing automatically. The words “Capture from tape...” appear in the Player. There is no video displayed in the Player during capture.

In the Log window, information is displayed about the capture process. If more than one tape is required, you are prompted when it is time to enter the next tape.

- 8 In Editing, click Match Media.
- 9 To assemble the EDL to include the newly-captured shots, click Assemble.

Colour Decision List (CDL)

CDLThe American Society of Cinematographers Colour Decision List (ASC CDL) colour correction specification defines a common language format for primary colour correction. It is becoming a standard defined by the ASC and has been adopted by most major manufacturers.

CDL is expressed by nine numbers (three RGB triplets) representing predefined colour functions: offset, slope, and power. The format of CDL is standardized so results in one colour corrector can be duplicated in

another corrector, so long as they both support the ASC CDL format. Currently, ASC CDL only supports primary colour correction, with the exception of chrominance (saturation change).

ACS CDL information can be stored as comments in an EDL from a Smoke and Flame, during the export EDL process. The ACS CDL comments from a Smoke and Flame EDL are supported in Lustre for import and export.

When you import an EDL with CDL comments or a sequence with CDL data from Smoke or Flame, the CDL data is stored in the Cut file. If you modify that CDL data, it gets saved with the Grade. This means that you can revert back to the original CDL data, by reloading the original Cut.

NOTE If you create the CDL data in Lustre, from scratch, it is only stored in the Grade, not the Cut.

CDL Menu

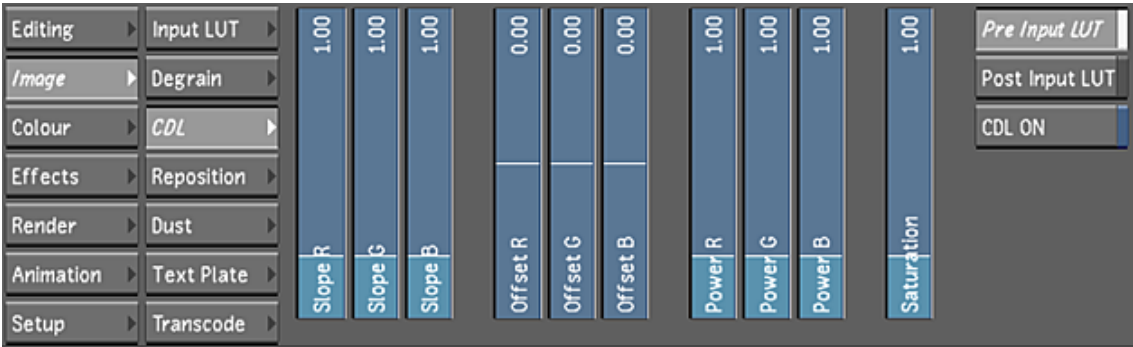
CDL:panelThe CDL menu allows you to:

- Change the four basic transfer functions (slope, offset, power, and saturation).
- Select whether you would like the transfer functions to be applied before, or after, an Input LUT is applied.
- Enable or disable the transfer functions you have set.

To access the CDL menu:

- 1 In the main menu, click Image.
- 2 Click CDL.

The CDL menu is displayed.



NOTE The CDL panel is not accessible from the ACS or the CP-100.

TIP You can increase or decrease the value quickly by holding **Shift** and dragging the slider, or slowly by holding **Alt** and dragging the slider.

Slope

CDL:SlopeWhen you change the slope transfer function, it allows you to change the lift and gain of the image without shifting the black level that is established by the offset. The following is a graph displaying how the slope value affects your image.

The following are the values to set the slope:

- Default value is 1.00 (i.e., no change).
- Minimum value is 0.00.

- Maximum value is 5.00.

Offset

CDL:OffsetThe offset transfer function either raises or lowers the overall brightness of the component, while keeping the slope constant.

The following are the values to set the offset:

- Default value is 0.00 (i.e., no change).
- Minimum value is -5.00.
- Maximum value is 5.00.

Power

CDL:PowerThe power transfer function changes the intermediate shape and is the only non-linear function.

The following are the values to set the power:

- Default value is 1.00 (i.e., no change).
- Minimum value is 0.00.
- Maximum value is 5.00.

Saturation

The saturation transfer function adjusts the intensity of the colours.

The following are the values to set the saturation:

- Default value is 1.00 (i.e., no change).
- Minimum value is 0.00.
- Maximum value is 5.00.

Pre/Post Input LUT

You can decide to apply the CDL data either before (Pre) or after (Post) applying an Input LUT.

NOTE Applying CDL data after applying an Input LUT will work only if the Input LUT is enabled within the Input LUT module.

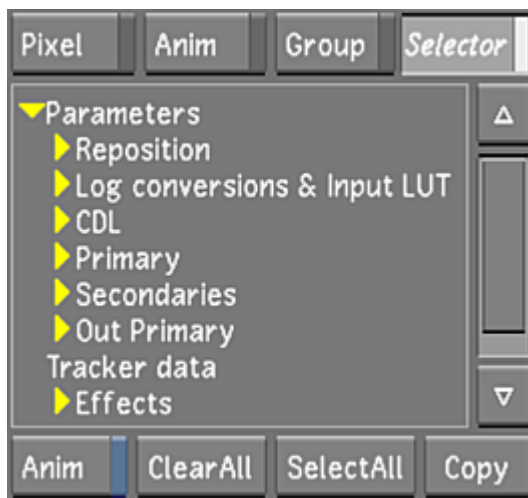
CDL On/Off

The CDL On/Off toggle allows you to either enable or disable CDL data. Since the Bypass All function does not bypass both the Input LUT and CDL, you would use the CDL On/Off button to 'mute' the effect of the CDL.

CDL Parameters in the Selector

Selector:CDL parameterCDL:parameter in SelectorThe Selector contains the following CDL parameters:

- Slope (RGB sliders)
- Offset (RGB sliders)
- Power (RGB sliders)
- Pre/Post Input LUT
- CDL On/Off



You can use the Selector to:

- Select the CDL section you want to copy/paste from shot to shot.
- Selectively load CDL data saved in the individual grades that are saved in the Grade bin.

Copying Parameters with the Selector

Lustre allows you to copy CDL parameters with the Selector in the same way as they would copy grading parameters. The parameters the Selector can copy are as follows:

- Colour grading parameters
- Input LUT selections
- CDL parameters
- Repositioning values
- Tracker data
- Effects
- Render flag settings

Loading CDL Data in the EDL Panel

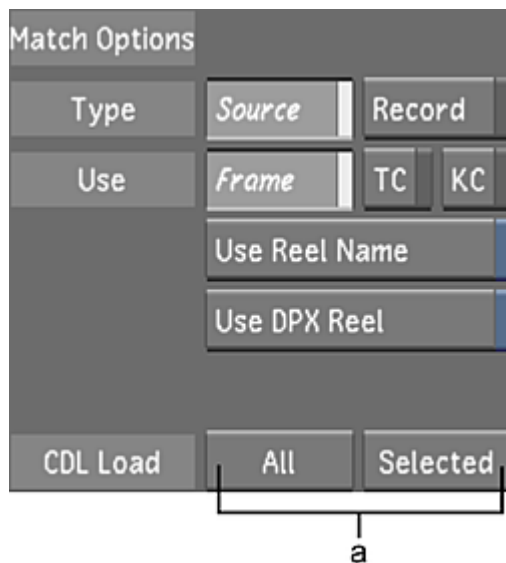
CDL:loading data in EDL panel The EDL panel contains an interface to support loading CDL data.

When you load an EDL into Lustre, the CDL data is not converted at that time. You can conform and assemble the EDL as you normally would do. However, if you want to use the CDL data of the currently loaded EDL, you need to use the CDL Load options to apply the CDL data to the cut file.

CDL Load Options

When you are ready to use CDL data, you can select one of two actions listed in the CDL Load list:

- **All:** Clicking All reads all CDL data from all the EDL events in the EDL Editor and applies the converted data to the events on the timeline by matching the record timecode (REC TC) value.
- **Selected:** Based on the selected events in the EDL Editor, the Selected action reads the CDL data of the selected events, then converts and applies each one of them to the events on the timeline by matching the REC TC value.



(a) CDL Load options

NOTE Loading CDL data does not erase the current grade applied to the shots. Loading CDL data only loads the data into the CDL panel. If the CDL data is already loaded, it will be overwritten with the newly loaded CDL data.

You can use a different EDL to conform and a different EDL to import CDL data. To load data from another EDL, **Ctrl**-click a CDL Load button. The data will be loaded using the Match Options from a cut selected in the Cut Name list. See [Changing a Cut](#) (page 107).

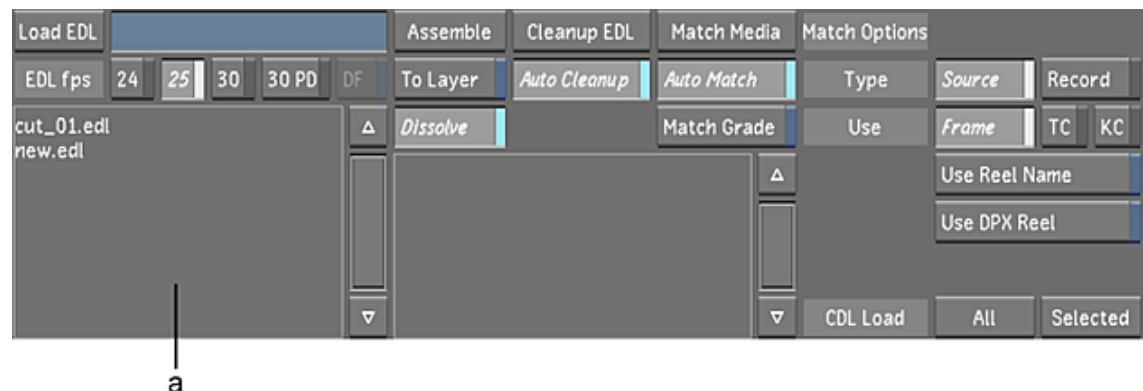
Assembling an EDL with CDL Data

The following procedure assembles an EDL with CDL data.

To assemble an EDL with CDL data:

- 1 Drag the shots that you want to assemble into the Library.
- 2 Select the Editing/Assemble menu.

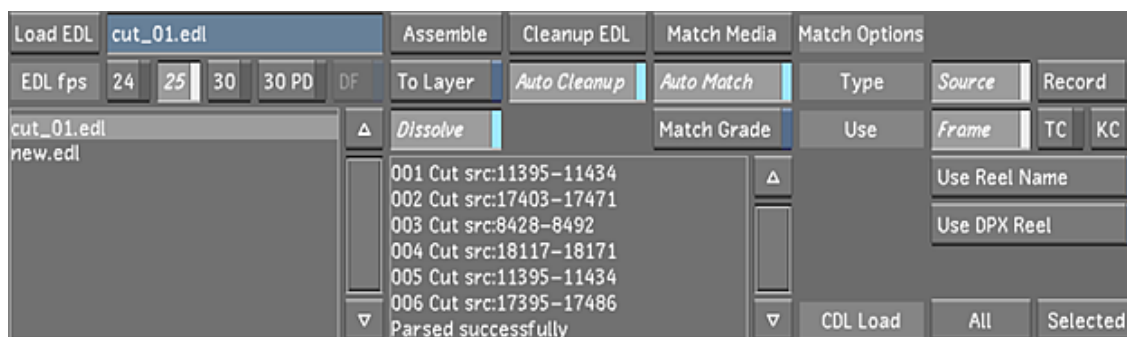
The Assemble options appear.



(a) EDL list

- 3 Select the EDL that contains the CDL data that you want to load from the EDL list.
- 4 Click Load EDL.

The selected EDL loads.



NOTE For more information on assembling an EDL, see [Assembling an EDL](#) (page 240).

- 5 Click Match Media to match the EDL event timecodes to the available shot timecodes in the Library prior to assembling.
- 6 Click Assemble to conform the EDL and build the cut.
The EDL events in the Assembly window are cleared.
- 7 Select the same EDL and click Load EDL.
- 8 Click CDL Load All or CDL Load Selected. See [CDL Load Options](#) (page 251).
The CDL data is now part of the current cut.

CDL EDL Comment

CDL data for a given shot is represented as a comment in the EDL file.

```
0001 VT029      V      C      09:11:16:20 09:11:22:22 01:00:13:05 01:00:19:07
*ASC_SOP (1.0 1.0 1.0) (0.0 0.0 0.0) (1.0 1.0 1.0)
```

There is one CDL comment line per event. See [Adding CDL Data to an EDL File](#) (page 236).

CDL XML File

CDL data for a given shot is represented as a reference in the EDL file to an XML file.

```
0003 VT032      V      C      12:11:43:21 12:11:52:07 01:00:27:05 01:00:35:15
*ASC_CC_XML cdn03345
```

NOTE The ASC CDL specification allows more than one colour correction data set per XML file. Lustre only supports a single colour correction data set per CDL and XML file. See ASC CDL specifications for more detail.

See [Adding CDL Data to an EDL File](#) (page 236).

CDL XML Files Location

To be able to use XML files, place them in an import sub-folder located in the project's Library folder:

```
<my project>/<scene 1>/<Library>/<import>
```


CDL Grading Using the Keypad

From the Image / CDL menu, you can use the Printer Light keyboard shortcuts (the Numeric Keypad) to perform CDL grading, in both Linear and Logarithmic modes. The Numeric Keypad is mapped as follows:

Key:	Function:
","	Mode Selection. You can cycle the Modes by pressing "," repeatedly. Modes are: ■ Slope ■ Offset ■ Power ■ Saturation
"_"	Reset: ■ Press once to reset the values of the current mode. ■ Press twice to reset all the CDL parameters.
"+"	Increase all parameter values by one increment for the current mode.
Enter	Decrease all parameter values by one increment for the current mode.
Ins	Copy the CDL parameters from the previous shot to the current shot.
NumLock	Increase the Red values for the current mode.
7	Decrease the Red values for the current mode.
4	Increase the Green and Blue values for the current mode.
1	Decrease Green and Blue for the current mode.
/	Increase the Green values for the current mode.
8	Decrease the Green values for the current mode.
5	Increase the Red and Blue values for the current mode.
2	Decrease the Red and Blue values for the current mode.
*	Increase the Blue values for the current mode.
9	Decrease the Blue values for the current mode.

Key:	Function:
6	Increase the Red and Green values for the current mode.
3	Decrease the Red and Green values for the current mode.

By holding Shift or Alt you can set the desired precision of the Numeric Keypad.

- **Shift:** Faster parameter setting, less precision.
- **Alt:** Slower parameter setting, more precision.

To modify the Saturation, it is recommended to use the following keys:

- **+:** Increase all parameters for the current mode.
- **Enter:** Decrease all parameters for the current mode

Other useful keyboard shortcuts:

- **CDL On/Off Key:** You can use the `Shift+E` keyboard shortcut, to enable or disable the CDL for the current shot from anywhere in the application.
- **CDL Locking:** CDL parameters can now be locked.
- **CDL Flag:** A new CDL flag is displayed on the shot in the storyboard when CDL data is applied to that shot. Right-clicking the CDL flag enables or disables CDL.
- **CDL Bypass:** You can now bypass the CDL. Bypass is a global way to enable or disable CDL from the Color pipeline so you can see your grade with or without the CDL without having to change the CDL on every shot.

editing:overview Use the Editing tools in Lustre to make modifications to your cuts, for example, to move, trim, cut, delete or replace shots. You can also add dissolves between shots, perform a confidence check, or use scene detection. Typically, you perform editing operations before colour grading. In this way, the colourist works on only the frames that are destined for the final master.

Perform a confidence check to detect changes in scenes. A confidence check is a process in which you manually compare the frames in an assembled EDL to frames captured from an offline digital cut. With a confidence check, you ensure that the scanned film frames match the frames that were edited together during the offline edit. This is an important step in guaranteeing that the final colour-graded timeline is in sync with the audio that appears in the final edited master.

With scene detection, you can take a long captured shot that spans multiple scenes and automatically introduce splices each time the scene changes. You can then grade the new shots separately. Do this, for example, when you are capturing a final edited HD master into Lustre for colour grading.

Representing the Timeline

The sequence of shots in a cut file is referred to as the timeline. Lustre has two visual ways of representing the timeline: the Storyboard and the multi-layer timeline.

When there is only one layer in the timeline, the Storyboard is simply the thumbnail view of the sequence of shots in the cut. When there are multiple layers in the timeline, the Storyboard is the thumbnail view of the flattened timeline, taking into consideration shots in a cut that represents a single-layer view of the timeline (see [Top Vertical Priority](#) (page 304)). This single layer corresponds with one of the following, depending on the soloing and muting status:

- The active layer of the multi-layer timeline, where either the active layer is soloed or the remaining layers are muted
- The default (flattened) view of the multi-layer timeline, where soloing is disabled

The multi-layer timeline organizes the cut into a multiple layer format. The elements appear as a series of rectangles on a time-proportional grid, with a positioner at the location of the current frame. Multiple layers are useful for grade versioning, roughing out edit sequences, and for multi-layer editing. This allows you to try various edits and colour grading versions on your shots before choosing the one which is used in the final master.

For more information about:

- The Storyboard, see [Editing with the Storyboard](#) (page 259).
- The multi-layer timeline, see [Multi-Layer Timeline](#) (page 277).
- Solo mode, see [Solo Mode](#) (page 309).

- Mute mode, see [Muted Layers](#) (page 305).

Accessing the Edit Menu

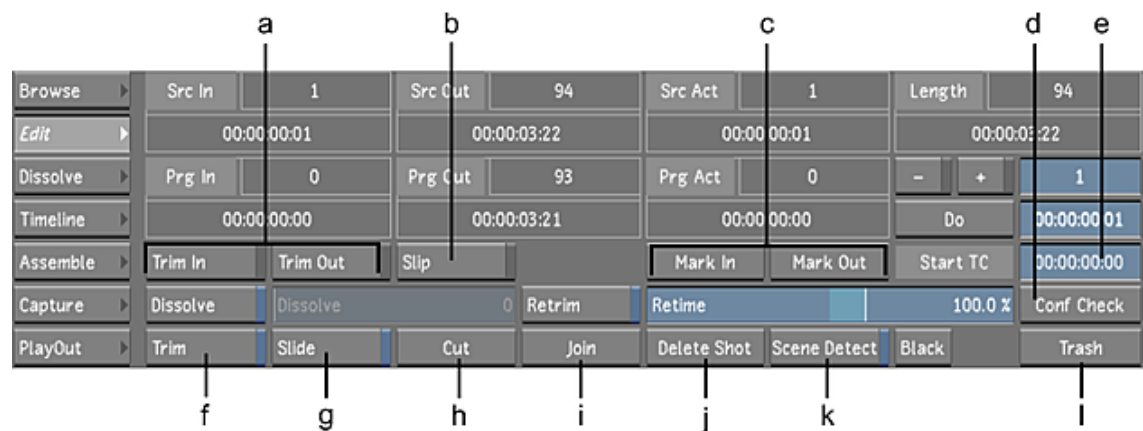
editing:accessing the edit menuTo modify shots in the timeline, you use the Edit menu.

NOTE If a layer is soloed, the Edit tools (Trash, Delete, Trim In/Trim Out, and Mark In/Out) default to 'Ripple End' behaviour, regardless of the Ripple Mode setting. If no layer is soloed, however, the Edit tools behave according to the individual Ripple Mode selected (Ripple Off, Ripple Start, or Ripple End) and apply to the active or visible layer that contains the focus point. For more information about Ripple Modes, see [Trimming Ripple Mode](#) (page 299).

To access the Edit menu:

- 1 In the Main menu, click Editing.
- 2 Click Edit.

The Edit menu appears.



(a) Trim In/Trim Out buttons (b) Slip button (c) Mark In/Out buttons (d) Confidence Check button (e) Start TC field
(f) Trim button (g) Slide button (h) Cut button (i) Join button (j) Delete Shot button (k) Scene Detect button
(l) Trash button

The Edit menu is made up of the following buttons.

Trim In/Trim Out Allows you to enter the number of frames to trim at the in or out point for the current shot. See [Trimming the Head and Tail of a Shot](#) (page 263).

Slip Moves the source frames within a shot without adjusting the shot's position in the timeline. See [Slipping a Shot](#) (page 266).

Mark In/Mark Out Sets the in or out point of the current shot at the Current Frame positioner in the Shot timebar. See [Changing In and Out Points for a Shot](#) (page 267).

Start TC Sets the frame number or timecode at which you would like the timeline to begin. If you enter a frame number, it is converted into the corresponding timecode value and vice versa. See [Modifying the Timeline's Starting Record Timecode](#) (page 310).

Trim Interactively sets the shot's in and out points when you drag left and right in the viewers. Use the left viewer to trim the in point and the right viewer to trim the out point. See [Trimming Interactively](#) (page 267).

Slide Slides a cut point forward or backward. See [Sliding the Cut Point between Shots](#) (page 268).

Cut Cuts one shot into two at the Current Frame positioner. See [Inserting Cuts](#) (page 269).

- Join** Joins two shots coming from the same source clip with consecutive source timecode. See [Joining Shots](#) (page 270).
- Delete Shot** Deletes a shot from the timeline.
- Scene Detect** Starts a scene detection process. When changes in your footage are above a threshold, a cut is introduced. See [Using Scene Detection](#) (page 312).
- Confidence Check** Allows you to compare your current timeline with a clip coming from a digital cut of your offline edit. See [Performing a Confidence Check](#) (page 310).
- Trash** Deletes shots from the Library or Storyboard when you drag them to the Trash button.

Global Access to Editing Hotkeys

editing:hot keyshot keys:accessing editing hot keys globallyWhen you enable the Editing While Grading button in the User settings, you can access the following editing hotkeys from any Lustre menu except the colourist multi-layer timeline.

Press:	To:
Shift+C	Cut the shot in two at the current frame.
Shift+J	Join the shot that was cut in two.
Shift+T	Start interactive visual trimming.
Shift+R	Start interactive visual sliding between the current and the previous shot.
Shift+S	Start a scene detection.

For more information about the Editing While Grading button, see [System & Menu Settings](#) (page 88).

Editing with the Storyboard

Storyboard:editing shotsediting:with the StoryboardThe Storyboard is a thumbnail representation of the shots in a cut and provides a Storyboard view of the active timeline layer. For a timeline with multiple layers, if Solo mode is disabled (this is the default), the Storyboard always displays the topmost layer. If Solo mode is enabled, the Storyboard displays the layer according to the location of the focus point. Lustre includes an assortment of tools for adding shots to, and rearranging shots in, your Storyboard. Once you place a shot in the Storyboard, you can modify it.

Adding Shots to the Storyboard

Storyboard:adding shotsLibrary:selecting shots for the Storyboardshots:adding to the StoryboardYou can add shots or timelines to the Storyboard by dragging them from the Library. You can also drag shots or timelines directly from the file browser and drop them into the Storyboard. In this case, the shots are also placed into the Library (if they are not already there).

TIP To add shots to the Storyboard where the insertion marker is positioned, enable Solo mode in the Timeline menu. If you do not do this, added shots are automatically appended to the end of the timeline. See [Multi-Layer Timeline](#) (page 277).

To add shots to the Storyboard:

- 1 Select shots in the Library.
The order in which you click shots in the Library determines their order in the Storyboard.

TIP If you select the wrong shots, click any empty grey area under the Storyboard. This releases the selected shots from the cursor.
- 2 Drag the shots to the Storyboard.
A yellow insertion marker appears on the Storyboard.

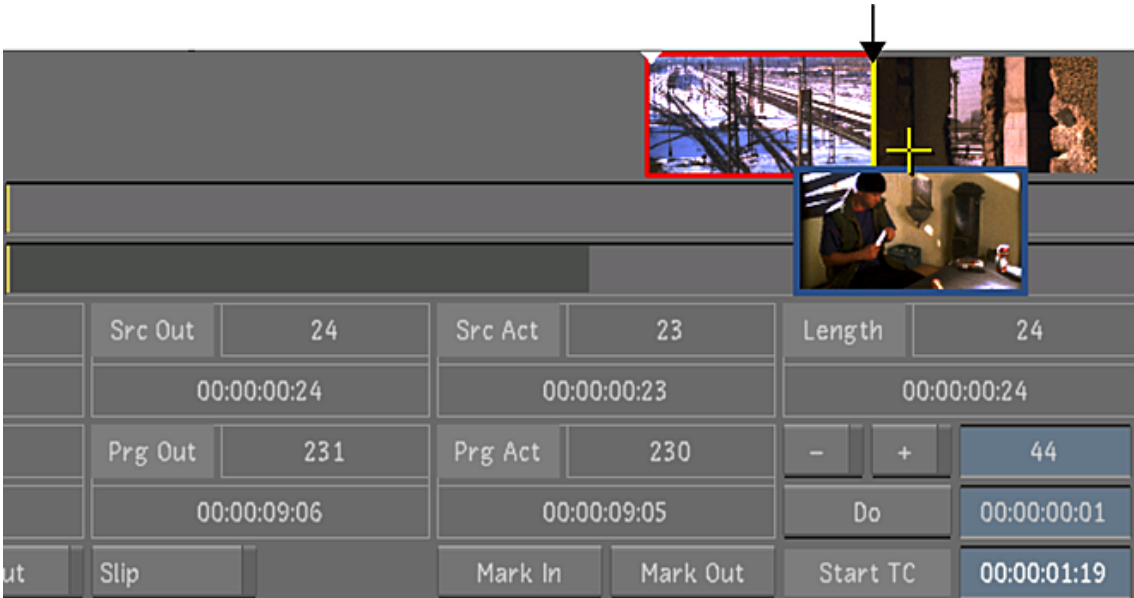


Image courtesy of Hungarian Academy of Film & Theatre, 3rd year

As you move the cursor back and forth along the Storyboard, the insertion marker moves.

- 3 Click to add the shots to the Storyboard.
The shots are added to the end of the Storyboard if Solo mode is disabled or to the location of the insertion marker if Solo mode is enabled.

Reordering Shots in the Storyboard

Storyboard:reordering shotsediting:shot order in the Storyboardshots:reordering in the StoryboardYou can reorder the shots in the Storyboard.

NOTE Solo mode in the Timeline menu must be enabled.

To reorder a shot in the Storyboard:

- 1 In the main menu, click Editing.
- 2 Click Timeline.
The Timeline menu appears.

- 3 Enable Solo.
- 4 Drag the shot you want to move.
The shot becomes partially transparent.
- 5 Drag the shot elsewhere in the Storyboard.
A yellow insertion marker shows where the shot will be placed.
- 6 Release the mouse, then click it again, to complete the edit.

TIP If you select the wrong shots, click the grey area to the left of the Trash button. This releases the selected shots from the cursor.

Duplicating Shots in the Storyboard

Storyboard:duplicating shots in editing:duplicating shots in the Storyboardshots:duplicating in the StoryboardYou can duplicate shots in the Storyboard.

NOTE Solo mode in the Timeline menu must be enabled.

To duplicate shots in the Storyboard:

- 1 After adding a shot to the Storyboard, drag the shot from the Library a second time to create a duplicate.

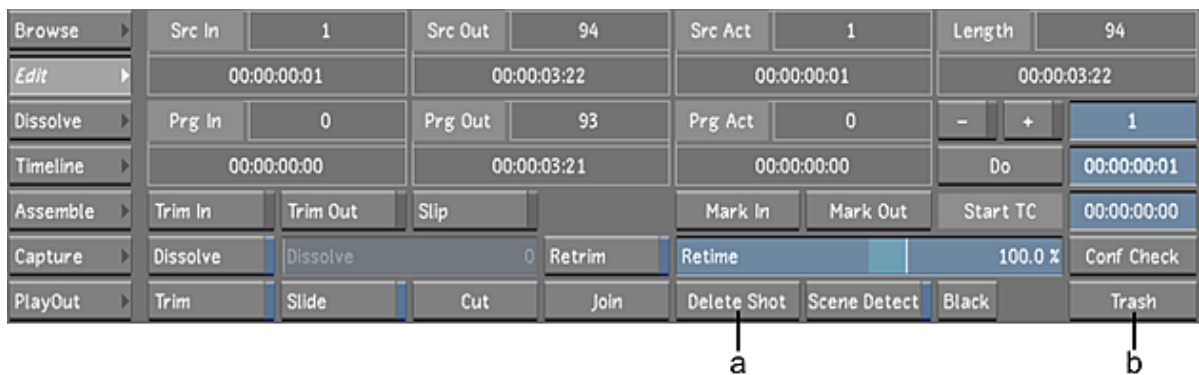
TIP If you select the wrong shots, click the grey area to the left of the Trash button. This releases the selected shots from the cursor.

TIP To insert a duplicated shot to the insertion marker location of the Storyboard, you must enable Solo mode in the Timeline menu. See [Multi-Layer Timeline](#) (page 277). Otherwise, the duplicated shot is inserted at the end of the Storyboard.

Deleting Shots

Timeline:deleting shots from editing:shots from the TimelineStoryboard:deleting shots from editing:shots from the Storyboarddeleting:shotsshots:deletingYou can delete shots from the Library, Storyboard, or multi-layer timeline (see [Deleting Elements](#) (page 286)). Deleting shots from the Library does not delete them from the Storyboard or multi-layer timeline, and vice versa.

Be aware that Timeline Solo and Ripple mode affects how the shots are deleted in the Edit menu. If Solo is enabled, the Trash and Delete tools default to Ripple End behaviour. If Solo is disabled, the Trash and Delete tools behave according to the Timeline Ripple mode (see [Trimming Ripple Mode](#) (page 299)) and apply to the layer that the focus point is on.



(a) Delete Shot button (b) Trash button

To delete a shot from the Storyboard:

- 1 Click Editing, and then click Edit to display the Edit menu.
- 2 Select the shot, and then do one of the following:
 - Click Delete Shot and then confirm the deletion.
 - Click and drag the shot to the Trash button, and then confirm the deletion.
 - Press **Shift+D**.

The selected shot is deleted.

Trimming from the Edit Menu

editing:frames by trimmingtrimming:frames in the timelineUse the Trimming tools to adjust the frames used in your edits. When you trim, you are either adding frames to or removing frames from the head or tail of the shots in your cut.

Be aware that timeline Solo and Ripple mode affects how the shots are trimmed in the Edit menu. If Solo is enabled, the Trim In/Trim Out and Mark In/Out tools default to Ripple End behaviour. If Solo is disabled, the Trim In/Trim Out and Mark In/Out tools behave according to the Timeline Ripple mode (see [Trimming Ripple Mode](#) (page 299) and [Slip & Slide Ripple Mode](#) (page 301)) and apply to the layer that the focus point is on.

You can trim by entering exact frame values, by dragging frames interactively, or by marking in and out points. You can also trim by sliding the cut point between shots or slipping the frames used in a shot.

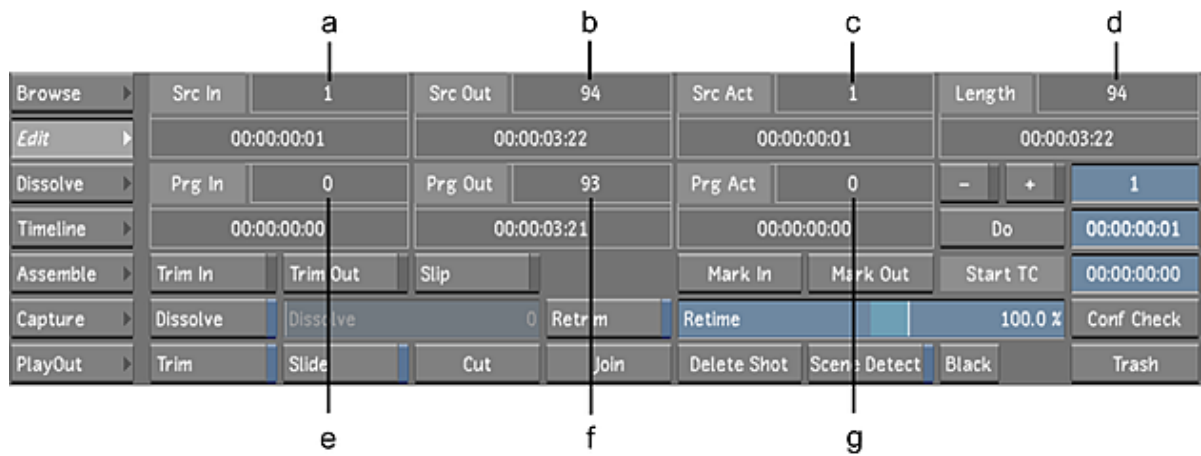
Viewing Shot Information

Storyboard:viewing shot informationtimecode:viewing informationshots:viewing informationWhen trimming, you will occasionally need information about the frames and timecode in your shots and cuts.

You can find shot information in the Edit menu.

For example, refer to the Src In field to determine if you can add a few frames to the start of the shot, or check whether you changed the length of the timeline by checking the value in the Length field.

You cannot enter values directly in these fields. They are updated when you scrub through the shot or Storyboard. For each field, the actual frame number is displayed, as well as the corresponding timecode value.



(a) Src In field (b) Src Out field (c) Src Act field (d) Length field (e) Prg In field (f) Prg Out field (g) Prg Act field

Use the following fields to view shot information.

Src In Displays the selected shot's Mark In frame number and timecode.

Src Out Displays the selected shot's Mark Out frame number and timecode.

Src Act Displays the absolute frame number of the current frame in the source material.

Length Displays the total length of the current shot in the timeline in frames and timecode.

Prg In Displays the program in point for the selected shot.

Prg Out Displays the program out point for the selected shot.

Prg Act Displays the current program frame number of the timeline.

NOTE The appropriate fields are highlighted when you enter an editing mode, indicating where editing operations affect your frames.

Trimming the Head and Tail of a Shot

shots:trimming head or tail framestrimming:head or tail framesYou can trim frames from the head or tail of one or more shots. The head is the first source frame that you specify to use in the shot. The tail is the last source frame that you use in the shot.

You specify the number of frames to trim from either the head or tail. If you do not want to change the overall length of your timeline, when you add frames to, or subtract frames from, one end of a shot, you should subtract from or add the same number of frames to the other end.

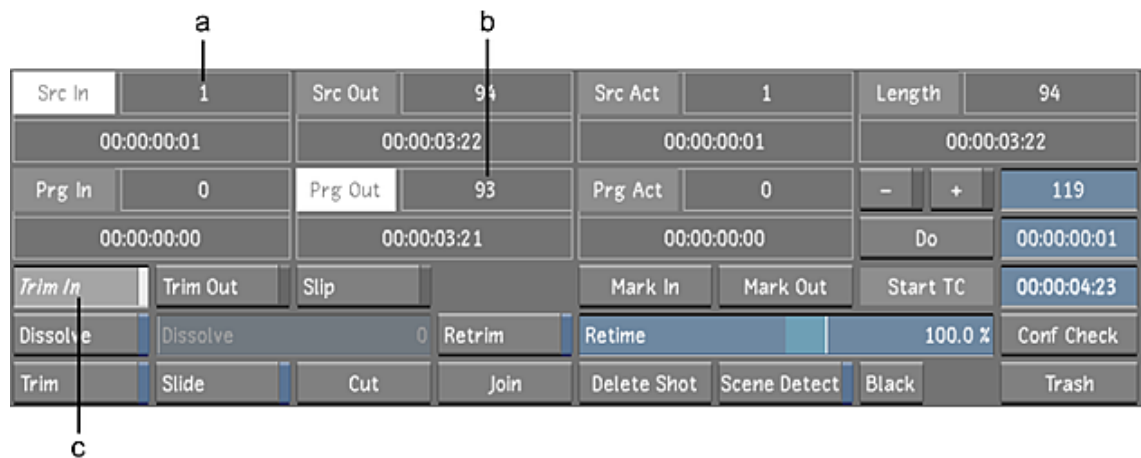
Remember that you cannot add more frames to a shot than the available number of handles. Also, you cannot trim a shot completely out of existence. If you want to delete a shot, use the Delete Shot button. See [Deleting Shots](#) (page 261).

To trim frames at the in point for one or more selected shots:

- 1 Select the shot you want to trim in the Storyboard. The selected shot's border turns red. To select multiple shots on the Storyboard, right-click each shot. The borders turn aqua.

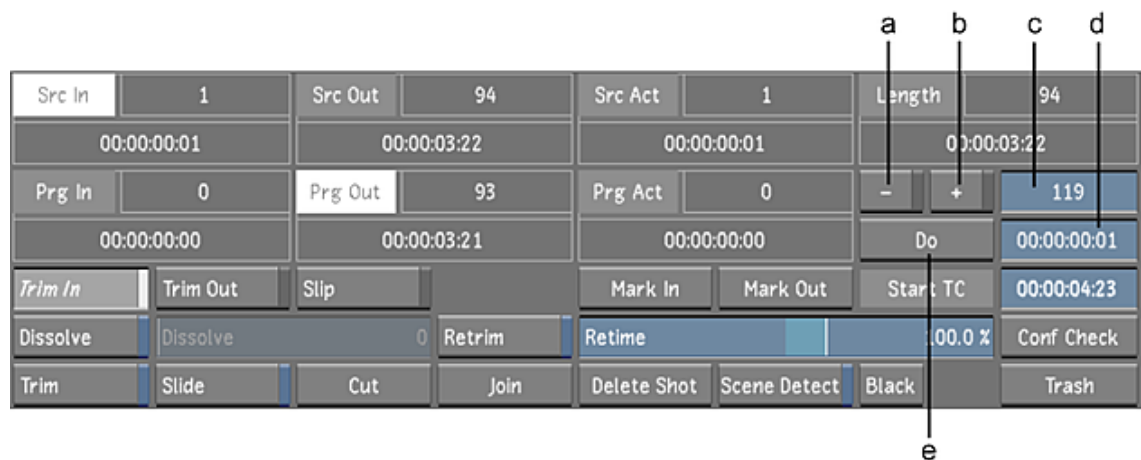
NOTE You can only add frames if your shots have available handles.

- 2 Click Editing in the main menu, and then click Edit.
The Edit menu appears.



(a) Src In field (b) Prg Out field (c) Trim In button

- 3 Click Trim In to go into Trim In mode.
Src In and Prg Out are highlighted because these values are changed by the Trim In operation.
- 4 Add frames to or remove frames from the mark in (or head):
 - Click + to add frames.
 - Click - to subtract frames.



(a) - (minus) button (b) + (plus) button (c) Do field (d) Do button (e) Do button

NOTE If you do not click either + or -, the trim operation removes an absolute number of frames.

- 5 Do one of the following:
 - Click the Do field, then click the frame field and enter the number of frames to add or subtract by using the numeric keypad. The frame number is converted into the corresponding timecode value.
 - Click the Do field and enter the timecode for the number of frames to add or subtract. The timecode is converted into the corresponding frame number.

NOTE Ctrl-click the field to clear it.

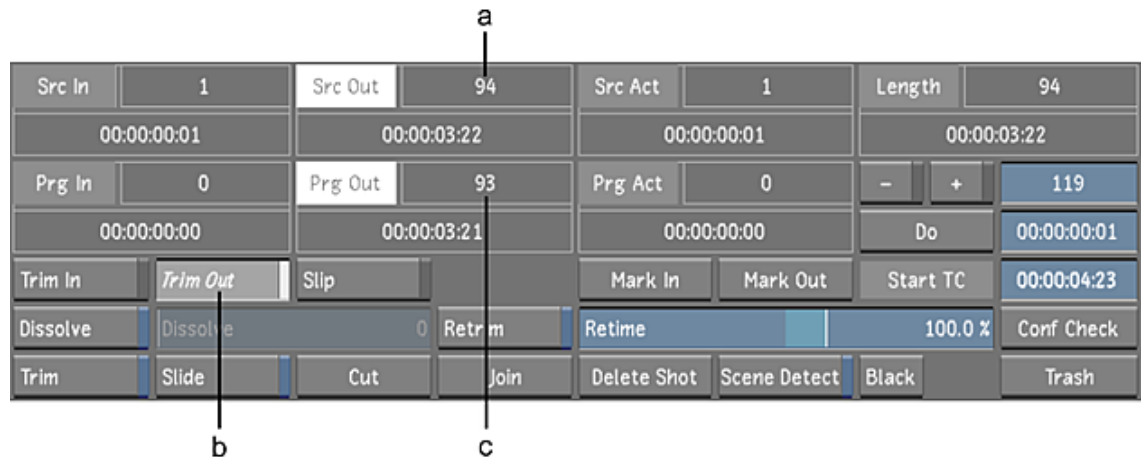
- 6 Click Do.
The specified number of frames is added to or subtracted from the shot(s). The Length field is updated to display the number of frames now used.

To trim frames at the out point for one or more selected shots:

- 1 Select the shot you want to trim in the Storyboard. The selected shot's border turns red. To select multiple shots on the Storyboard, right-click each shot. The borders turn aqua.

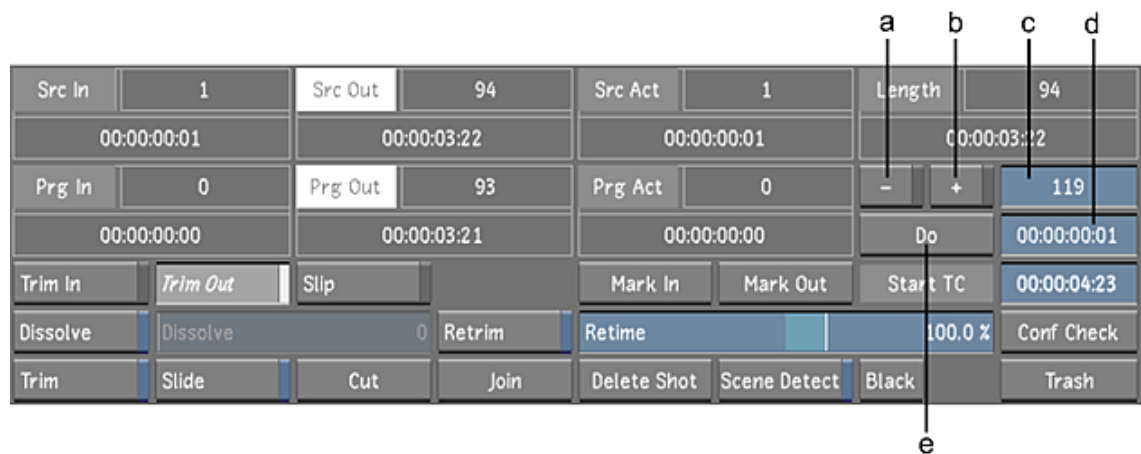
NOTE You can only add frames if your shots have available handles.

- 2 Click Editing in the main menu, and then click Edit.
The Edit menu appears.



(a) Src Out field (b) Trim Out button (c) Prg Out field

- 3 Click Trim Out to go into Trim Out mode.
Src Out and Prg Out are highlighted because these values are changed by the Trim Out operation.
- 4 Add frames to or remove frames from the mark out (or tail):
 - Click + to add frames.
 - Click - to subtract frames.



(a) - (minus) button (b) + (plus) button (c) Frame field (d) Do field (e) Do button

NOTE If you do not click either + or -, the trim operation removes an absolute number of frames.

- 5 Do one of the following:
 - Click the Do field, then click the frame field and enter the number of frames to add or subtract by using the numeric keypad. The frame number is converted into the corresponding timecode value.
 - Click the Do field and enter the timecode for the number of frames to add or subtract. The timecode is converted into the corresponding frame number.

NOTE Ctrl-click the field to clear it.

6 Click Do.

The specified number of frames are added to or subtracted from the shot(s). The Length field is updated to display the number of frames now used in the shot.

Slipping a Shot

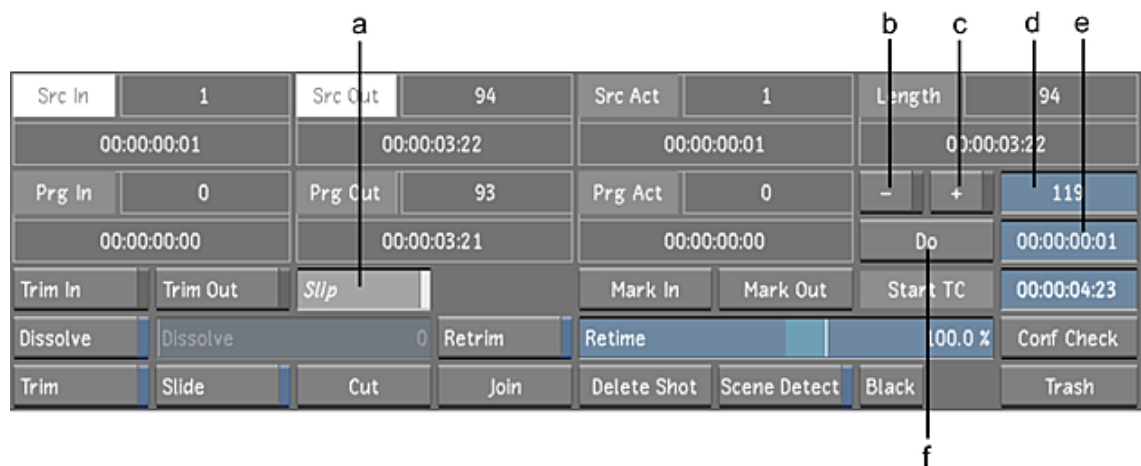
slipping, shots in the timelineshots:slipping in the timelineYou can slip the frames used in one shot without adjusting the shot's position in the timeline. You may need to slip your shot to synchronize action in the picture to the audio or because unwanted frames are appearing at either the head or tail.

To slip one or more shots:

- 1 Select the shot you want to slip in the Storyboard. The selected shot's border turns red. To select multiple shots on the Storyboard, right-click each shot. The borders turn aqua.

NOTE You must have available handles to slip a shot.

- 2 Click Editing in the main menu, and then click Edit.
The Edit menu appears.



(a) Slip button (b) - (minus) button (c) + (plus) button (d) Frame field (e) Do field (f) Do button

- 3 Click Slip to go into Slip mode.
Src In and Src Out are highlighted.
- 4 Slip forward or backward:
 - Click + to slip forward.
 - Click - to slip backward.
- 5 Do one of the following:
 - Click the Do field, then click the frame field and enter the number of frames you want to offset the shot by. The frame number is converted into the corresponding timecode value.
 - Click the Do field and enter the timecode for the number of frames to offset the shot by. The timecode is converted into the corresponding frame number.

NOTE Ctrl-click the field to clear it.

6 Click Do.

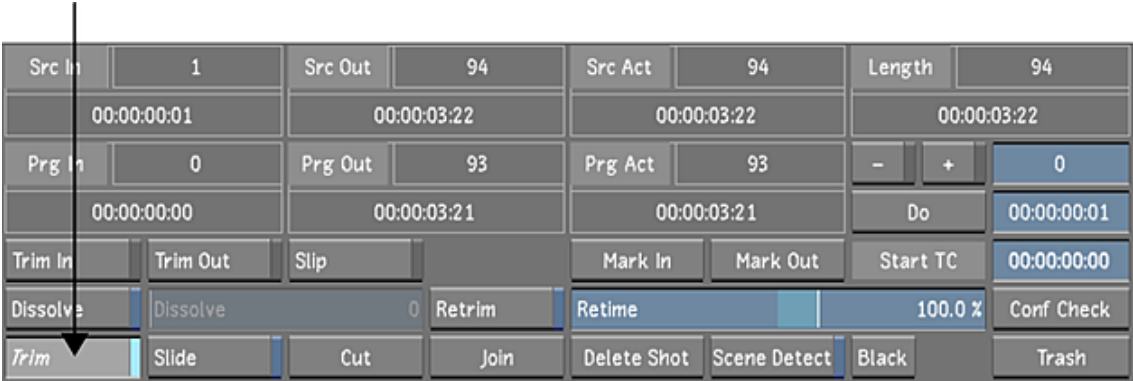
The shot or shots are offset by the specified number of frames. The Src In and Src Out fields are updated to display the frames used.

Trimming Interactively

Storyboard:trimming frames interactivelytrimming:interactivelyediting:in and out points interactivelyYou can trim frames interactively. When you trim interactively, you scrub the Player to add frames to, or remove frames from, the in or out point.

To trim interactively:

- 1 In the Storyboard, select the shot you want to trim.
- 2 Click Editing in the main menu, and then click Edit to display the Edit menu.
- 3 Enable Trim.



TIP If the Editing While Grading button is enabled in the User settings, you can start interactively trimming shots from any menu by pressing **Shift+T**. For more information about the Editing While Grading button, see [System & Menu Settings](#) (page 88).

In Trim mode, you see the first frame of the shot in the left viewer, and the last frame in the right viewer.

- 4 Do one of the following:
 - To trim frames at the head, click the left viewer and then drag the cursor left to add frames or right to subtract frames.
 - To trim frames at the tail, click the right viewer and then drag the cursor right to add frames or left to subtract frames.
- 5 For greater control of the trim operation, middle-click as you drag to decrease the start frame by one frame or right-click to increase the offset by one frame.
- 6 To exit the Interactive Trim mode, do one of the following:
 - Click Trim.
 - Press the **Esc** key.

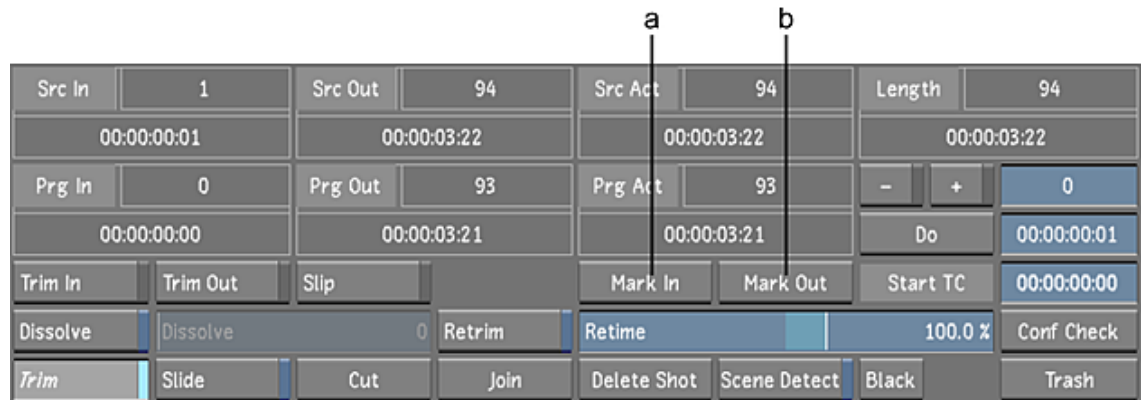
Changing In and Out Points for a Shot

trimming:in and out pointsYou can change the in and out points for a shot. This is like trimming, except you can only shorten a shot by changing the in or out points.

The in point is the first frame used in a shot. The out point is the last frame. Setting a new in or out point shortens the total length of a shot. The frames that you remove by changing the in or out point become available handles that you can use in later trimming operations.

To change the in or out point for a shot:

- 1 In the Storyboard, select the shot you want to modify, and then scrub to the frame you want to mark as the in point.
- 2 Click Editing, and then click Edit.
The Edit menu appears.



(a) Mark In button (b) Mark Out button

- 3 Click Mark In.
The extra frames are trimmed from the head of the shot.
- 4 Scrub to the frame you want to mark as the out point.
- 5 Click Mark Out.
Extra frames are trimmed from the tail of the shot.

NOTE You must go into one of the Trim modes to add frames back to the head or tail of the shot.

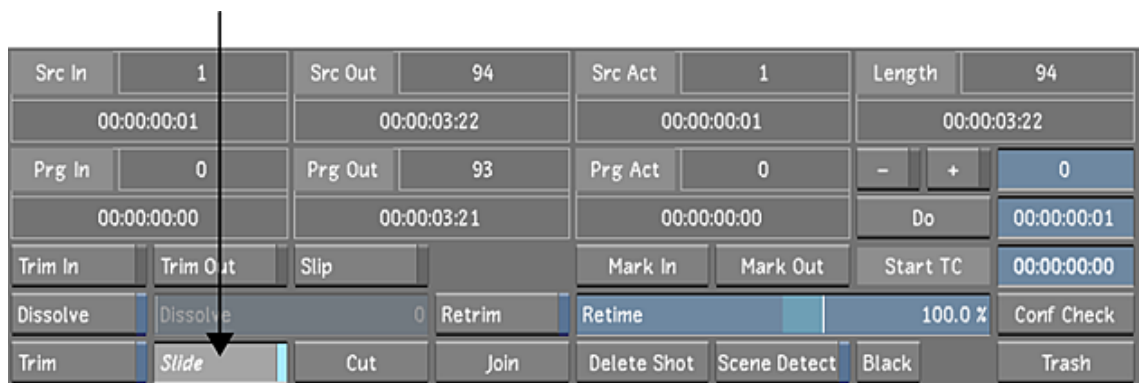
Sliding the Cut Point between Shots

Storyboard:sliding the cut point between shots
cut point, sliding between shots
sliding, cut point in a shot
You can interactively move the cut point between two shots forward or backward, if handles are available. Using Slide does not adjust the overall length of your timeline. By removing frames from one side of the cut, you automatically add frames to the other side.

You may want to slide the cut point to synchronize the cut to audio or simply to use different frames in your shot.

To slide a cut point:

- 1 In the Storyboard, select the shot to the right of a cut point.
- 2 Click Editing, and then click Edit to display the Edit menu.
- 3 Click Slide.



TIP If the Editing While Grading button is enabled in the User settings, you can start interactive visual sliding between the current and the previous shot from any menu by pressing **Shift+R**. For more information about the Editing While Grading button, see [System & Menu Settings](#) (page 88).

In Slide mode, you see the outgoing frame before the cut in the left viewer and the incoming frame after the cut in the right viewer.

- 4 Drag in either viewer to move the cut point.

If both clips have available handles, drag to the left or right to move the cut point.

Frames are added to one side of the cut and subtracted from the other to keep the total timeline duration the same. When you run out of handles, you can no longer continue sliding in the same direction.

- 5 For greater control of the slide operation, middle-click the mouse to decrease the cut point by one frame or right-click to increase the cut point by one frame.

- 6 To exit the Interactive Slide mode, do one of the following:

- Click Slide.
- Press the **Esc** key.

The timeline is updated when you exit Slide mode.

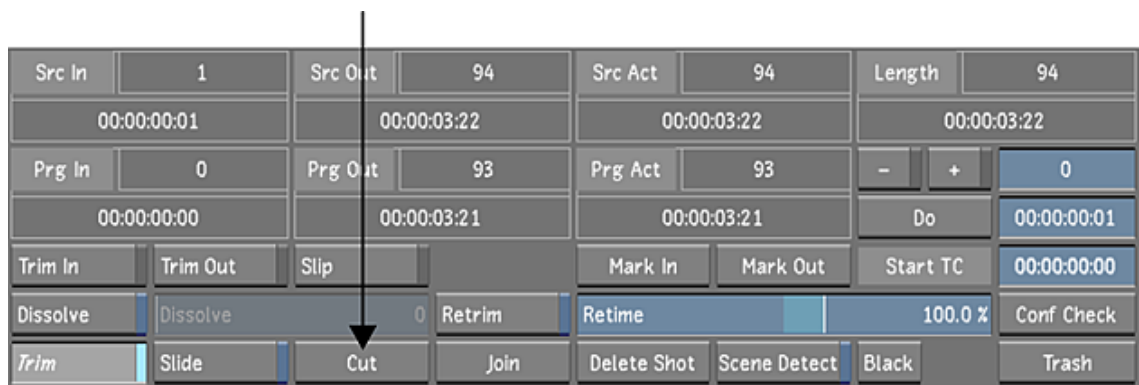
Inserting Cuts

Storyboard:inserting cuts between scenescuts:inserting between shotssplicing:shotsYou can cut a shot into two shots. This is useful when you want to insert cuts between scenes, or if you need to apply separate grades within a shot.

NOTE If working on field-based material, you cannot apply a cut between two fields of an image.

To insert a cut in a shot:

- 1 In the Storyboard, scrub to the position where you want to introduce the cut.
- 2 Click Editing, and then click Edit to display the Edit menu.
- 3 Click Cut.



The shot is cut into two separate shots.

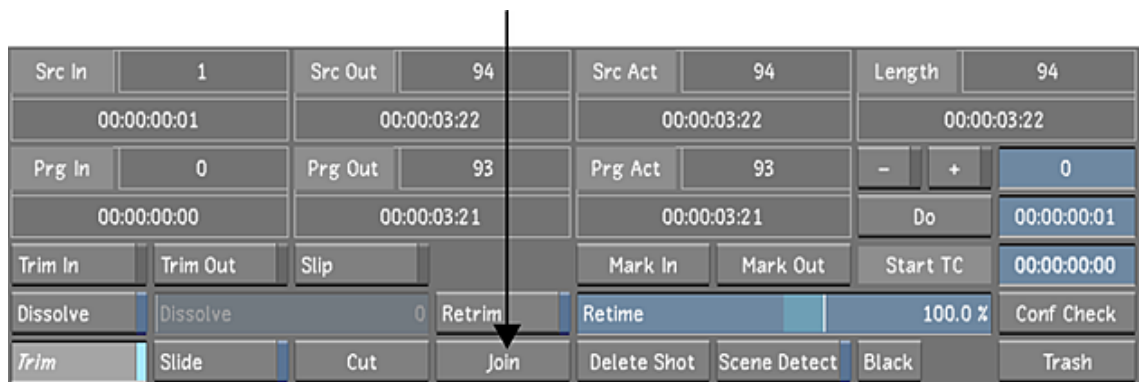
TIP If the Editing While Grading button is enabled in the User settings, you can insert a cut from any menu by pressing **Shift+C**. For more information about the Editing While Grading button, see [System & Menu Settings](#) (page 88).

Joining Shots

Storyboard:joining shots together
shots:joining back together
joining, shots together
You can rejoin a shot that is cut. The shots have to come from the same original source, must be adjacent in the Storyboard, and must be incrementing timecode. Join recreates the original sequence, even if there is material missing from the current Storyboard. For example, if you create a cut and trim out something in the middle of the original shot, you can join the shots back together and the missing frames are put back.

To join shots together:

- 1 In the Storyboard, select the right-most (also known as the B-side) of the previously cut shots.
- 2 Click Editing, and then click Edit to display the Edit menu.
- 3 Click Join.



The shots are joined together.

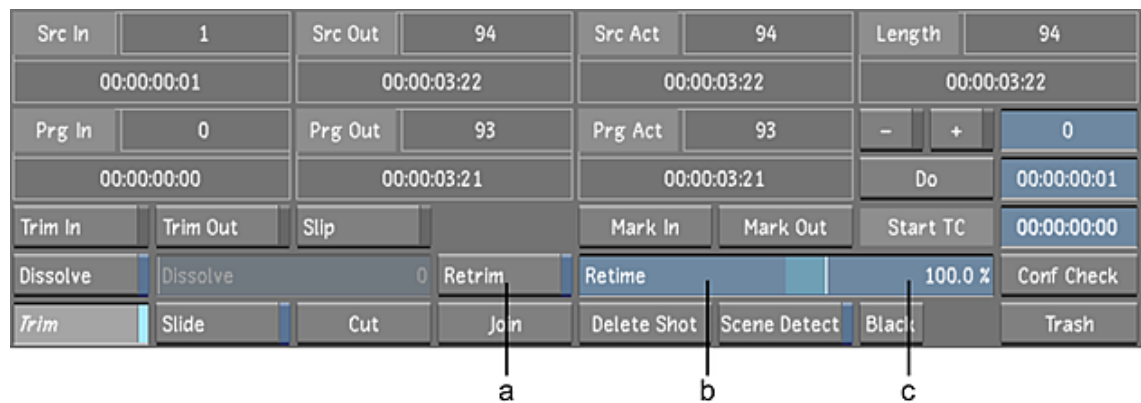
TIP If the Editing While Grading button is enabled in the User settings, you can join shots from any menu (except the colourist multi-layer timeline) by pressing **Shift+J**. For more information about the Editing While Grading button, see [System & Menu Settings](#) (page 88).

Changing Playback Speed

playback,changing speedspeed:playbackretime,playback speed for shotsUse the Retime option to change the playback speed of your shots. When you change the playback speed of a shot, Lustre duplicates or removes frames as needed so that the shot plays at the specified constant frame rate. Changing the speed changes the length of the shot, so you may need to trim the shot after you change the speed.

To change a shot's playback speed:

- 1 Select the shot in the Storyboard that you want to adjust.
- 2 Click Editing, and then click Edit.



(a) Retrim button (b) Retime slider (c) Retime field

- 3 Enable Retrim to trim the shot so that the same source in and out points are used. You can also trim the shot using the tools in the Edit menu.
If you do not enable Retrim, the source out point changes shots. This is especially noticeable when you speed up a shot, since you may end up with black frames at the end of the adjusted shot. You can remove the black frames using the trimming tools. See [Trimming from the Edit Menu](#) (page 262).
- 4 Drag the Retime slider to the new playback speed or right-click on the Retime slider to enter a retime value in the Retime field.
- 5 Play back the shot to see the effect of the speed change.

Replacing Shots

Storyboard:replacing shotsreplacing, shots in the Storyboardshots:replacing in the StoryboardYou can take a shot from the Library (the source shot) and swap it with another shot in the Storyboard (the destination shot). You can replace the destination shot with a source shot starting at the first frame of the source, or you can replace the destination shot with a source for which you have offset the starting frame.

NOTE You can also replace a shot in the Timeline menu using the Library view. See [Replacing Shots in the Timeline](#) (page 284).

When replacing shots, you do not modify the overall duration of the timeline.

To replace a shot in the Storyboard without offsetting the source shot:

- 1 Shift-click the shot in the Library (the source shot) that you want to use to replace the shot in the Storyboard (the destination shot).
- 2 Move the source shot over the destination shot in the Storyboard.

The destination shot is highlighted with an orange box.

- 3 Click the destination shot.

The destination shot is replaced by the source shot.

To replace a shot in the Storyboard with an offset source shot:

- 1 Shift-click the shot in the Library (the source shot) that you want to use to replace the shot in the Storyboard (the destination shot).
- 2 Move the source shot over the destination shot in the Storyboard.
The destination shot is highlighted with an orange box.
- 3 Shift-click the destination shot.
A dual view appears. In the left viewer, you see the original shot and in the right viewer you see the new shot.
- 4 Drag in the right viewer.
The start frame of the first shot begins to change. You can see by how much you are offsetting the start frame by referring to the numbers in the upper-left corner of the screen.
- 5 For greater granularity, middle-click and drag to decrease the start frame by one frame and right-click and drag to increase the offset by one frame.
You can also use the numeric keypad to change the offset. Specify a negative number and then press **Enter** to decrease the offset or specify a positive number and then press **Enter** to increase the offset.
- 6 Press **Enter** on the numeric keypad to complete the replace shot operation.

NOTE If the source shot is shorter than the destination shot, or if you offset the source starting point too much, part of the destination shot will not contain any images. Instead, an X appears in the viewer for these frames.

Creating Dissolves

dissolves:creatingdissolves:overviewUse dissolves to create a gradual blend between two shots. A dissolve is a transition that causes the outgoing shot to gradually disappear at the same time as the incoming clip gradually appears. Depending on the number of available handles, you can use dissolves to create long, gradual changes, or you can create dissolves with short durations (called soft cuts).

NOTE Centre dissolves are created automatically if you import an EDL that contains dissolves. However, other transitions, like wipes, are replaced by straight cuts.

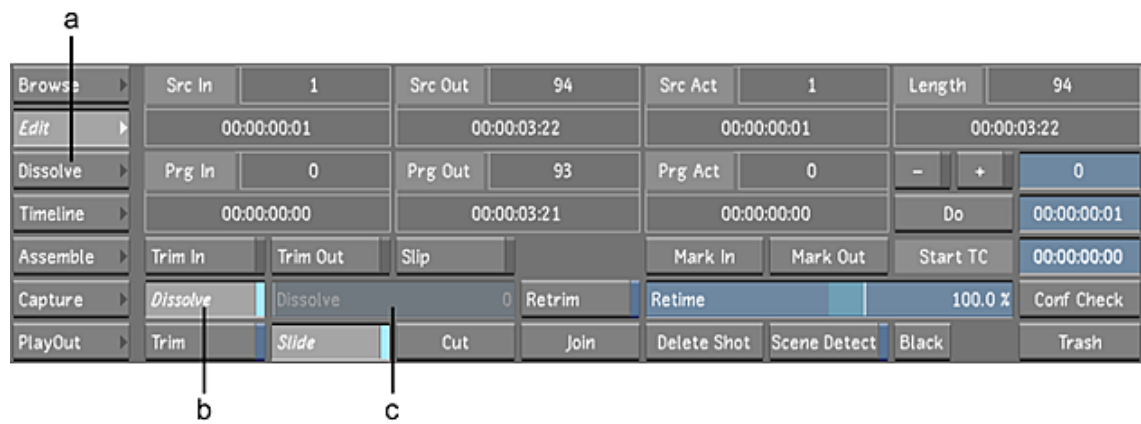
Adding a Dissolve

shots:adding dissolvesdissolves:adding between shotsYou can add a dissolve between two shots provided that there are a sufficient number of underlying handles.

NOTE You must have sufficient handles to add a dissolve. If you do not, use the Retrim tool. For more information, see [Creating Additional Handles for Dissolves](#) (page 273).

To add a dissolve between two shots:

- 1 Click **Editing**, and then click **Edit**.
The **Edit** menu appears.



(a) Dissolve menu button (b) Dissolve button (c) Duration slider

- 2 Place the positioner on or near the transition to which you want to add a dissolve.

NOTE You can also add a fade-in at the beginning of the timeline and a fade-out at the end. Also, when adding a fade-in or fade-out to a gap on Layer 1, Lustre automatically fills the gap with a virtual colour source clip.

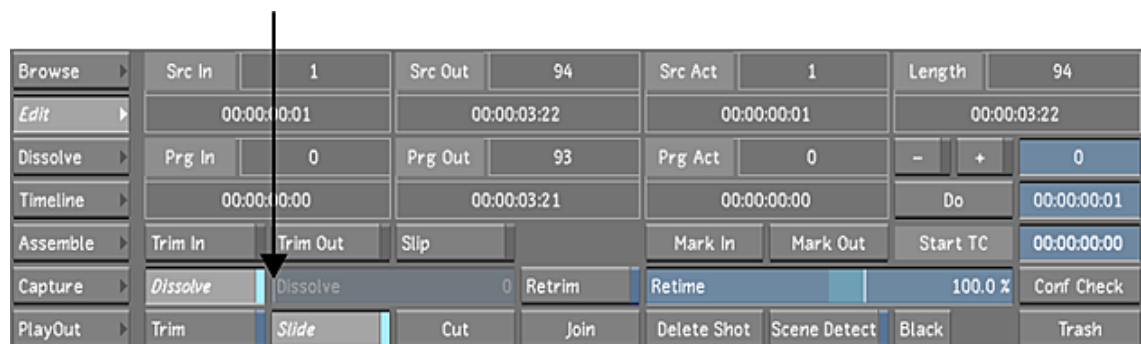
- 3 Enable Dissolve, and then drag the Dissolve slider to set the dissolve duration.
- 4 To edit the shape of the Dissolve curve, see [Editing Dissolves](#) (page 274).

Changing Dissolve Duration

dissolves:changing duration You can change the duration of a dissolve at any time.

To change dissolve duration:

- 1 Select the shot to the left of the dissolve.
- 2 In the Edit menu, drag the Dissolve slider to adjust the dissolve duration or right-click the slider for the pop-up entry.

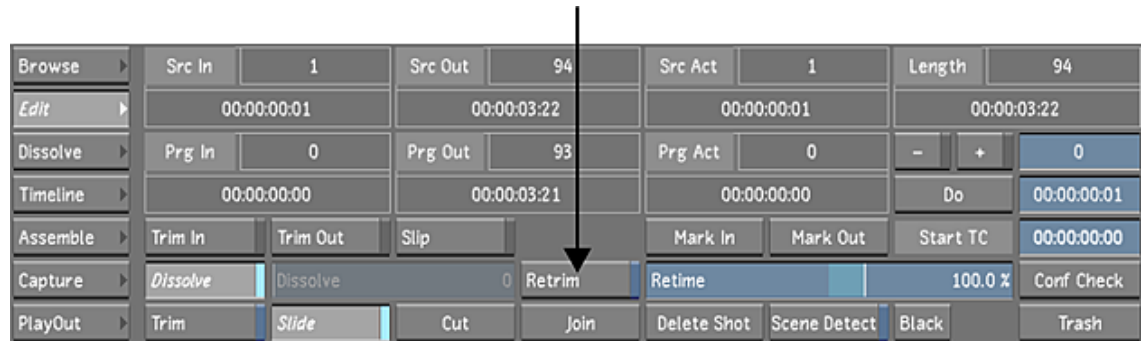


Creating Additional Handles for Dissolves

dissolves:creating additional handles for trimming:shots for dissolvesdissolves:retrimming You can trim handles from outgoing and incoming shots and use them to add a dissolve.

To create handles for a dissolve:

- 1 In the Storyboard, select the shot to the left of the cut point to which you want to add a dissolve.
- 2 In the Edit menu, enable Retrim.



- 3 Enable Dissolve, and then drag the Dissolve slider to set the duration or right-click the slider for the pop-up entry.

Frames are automatically trimmed from the tail of the outgoing clip and the head of the incoming clip.

Editing Dissolves

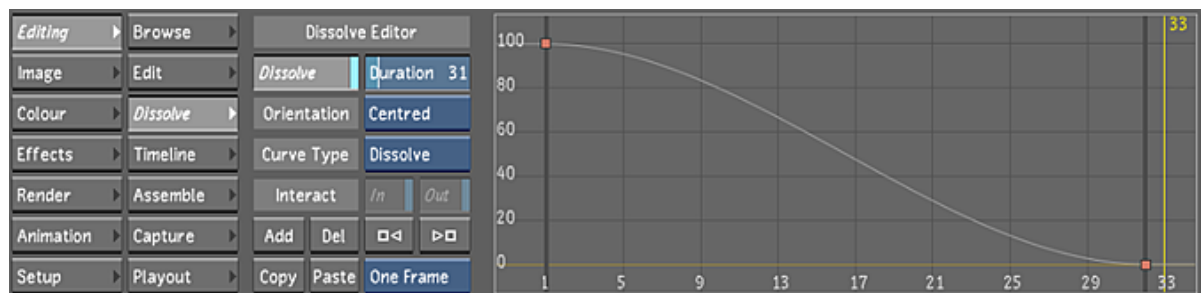
dissolves:editingspeed:dissolvesdissolves:changing speedThe Dissolve menu allows you to animate your dissolve. Use the controls located in the lower left side of the Dissolve editor to add, delete, copy, paste and navigate between keyframes. Navigate the timeline to edit any transition using the Dissolve menu's editor and curve window. Use the navigation buttons, the hotkeys or the Autodesk Control Surface to navigate the timeline.

TIP

To enter the Dissolve editor from the timeline, you can double-click on the Dissolve icon.

Right-click to zoom the Dissolve curve and middle-click to pan. To reset the Dissolve curve, press the Home key on the keyboard.

Keyframe controls are located on the lower left side of the Dissolve curve window. On the right side of the Dissolve curve window, you will find the Animation Controls and the Animation options. See [Animation](#) (page 541).



Dissolve button Enable the dissolve located at the current transition.

WARNING

Re-enabling a disabled dissolve will restore dissolve metadata (e.g., duration, orientation) for the current session only. Saving the cutfile with the Dissolve button disabled does not save the original dissolve settings.

Duration field Set the length of the dissolve. The default value is the defined in the User settings. See [Tools Settings](#) (page 93).

Orientation box Define the orientation of the dissolve.

Select:	To:
Centred	Place the dissolve in the middle of the transition.
From Cut	Start the dissolve at the cut point.
Up To Cut	End the dissolve at the cut point.

Curve Type box Select the type of dissolve curve.

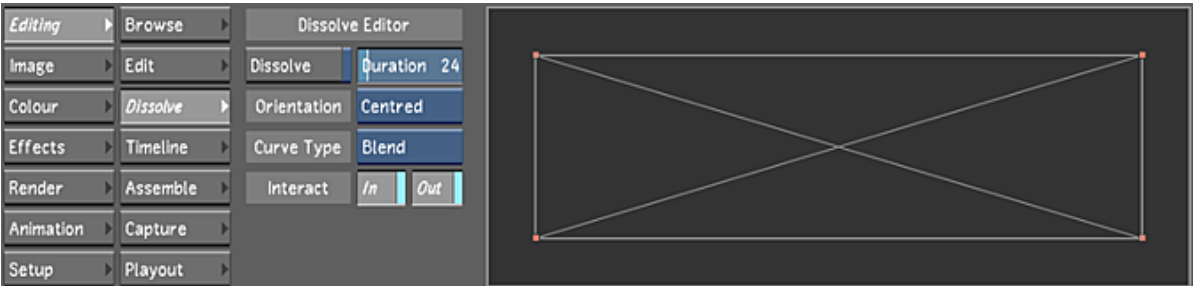
Select:	To:
Blend	Display two curves to blend between the outgoing and incoming shots.
Dissolve	Display a dissolve curve similar to that found in Smoke and Flame. Display buttons in the Dissolve editor to edit and navigate between keyframes. NOTE Importing a timeline with dissolves from Wiretap server 2011 Extension 1 or higher will include dissolve curves.

In and Out buttons Enable to blend between the outgoing and incoming shots. Enabled when the Curve Type is set to Blend.

Use the windows in the Dissolve menu to edit the rate at which the dissolve changes.

The Blend Curves window displays two curves: one represents the outgoing shot and the other represents the incoming shot. These curves are plotted on a graph that shows time vs. percent visible. When curves are at the top of the window, the frames at that point in time are 100% visible. Curves near the bottom correspond to 0% visible frames.

By default, each curve progresses in a linear fashion from one corner of the window to the opposite corner.



NOTE

Cutfiles from versions prior to Lustre 2011 Extension 1 will display the Blend curve.

To modify the Dissolve curve:

- 1 In the Editing menu, click Dissolve to display the Dissolve menu.
- 2 In the Curve Type box, select Dissolve.

To modify the Blend curve:

- 1 In the Editing menu, click Dissolve to display the Dissolve menu.
- 2 In the Curve Type box, select Blend.
- 3 Enable Interact In or Out to specify whether you are modifying the outgoing or incoming frames of the dissolve. You can also work on both curves simultaneously.

You can change the start or end visibility to any value between 0-100%; however, you cannot adjust the time at which a dissolve starts or ends in the Dissolve Curves window. To do this, return to the Edit menu and use the Dissolve slider.

Turning Dissolves Off

disabling:dissolvesdissolves:disabling and re-enablingUse the Dissolve button in the Edit menu or the Dissolve menu to toggle a dissolve on and off.

Resetting Dissolves

To reset the Dissolve curve to its default value (i.e., two keyframes), press the Reset button in the Lustre user interface.

Adding a Virtual Black Clip using the Storyboard

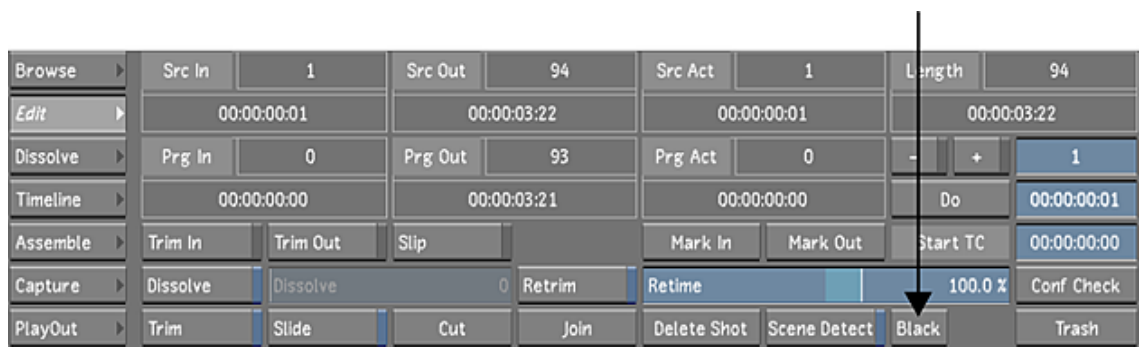
black clip, adding to the StoryboardStoryboard:adding a virtual clipVirtual black clips can be added anywhere on the timeline. The default duration of each clip is one second, according to the current project frame rate. See [Adding Black Media to the Timeline](#) (page 286).

To add a virtual black clip using the Storyboard:

- 1 In the Main menu, click Editing, and then Edit.

NOTE Solo mode must be enabled if you want to add the black clip to a specified position. See [Multi-Layer Timeline](#) (page 277). If Solo mode is disabled, the black clip is inserted at the end of the timeline.

- 2 Click Black.



- 3 Move the clip to the Storyboard.

A yellow insertion marker appears at the cut where the black clip is entered.

NOTE The status of Ripple and Snap modes is taken into account when adding black media.

- 4 Insert the clip on the Storyboard.

NOTE You can change the virtual clip's colour in the Virtual Black Clip Colour group in the Project settings. See [Engineering Settings](#) (page 73).

Multi-Layer Timeline

Timeline menu, accessing Timeline:accessing the Timeline menuThe multi-layer timeline view organizes footage or elements into a multi-layer format. You can scroll, pan, and zoom the multi-layer timeline, as well as rearrange elements on the timeline by dragging and dropping.

The multi-layer timeline in Lustre supports Video Tracks and Video Layers. However, vertical compositing is not supported in Lustre.

Multi-layer timeline editing is useful for roughing out edit sequences and grade versioning. In addition, shot selections are now linked between the timeline and the Storyboard.

You can also copy the grading information in the multi-layer timeline or colourist multi-layer timeline. See [Copying Grading Information in the Colourist Timeline](#) (page 411).

The multi-layer timeline allows you to display footage, play out to tape, and render in accordance with rules that prioritize some shots or layers over others. See [Displaying the Multi-Layer Timeline](#) (page 304).

Timeline Menu

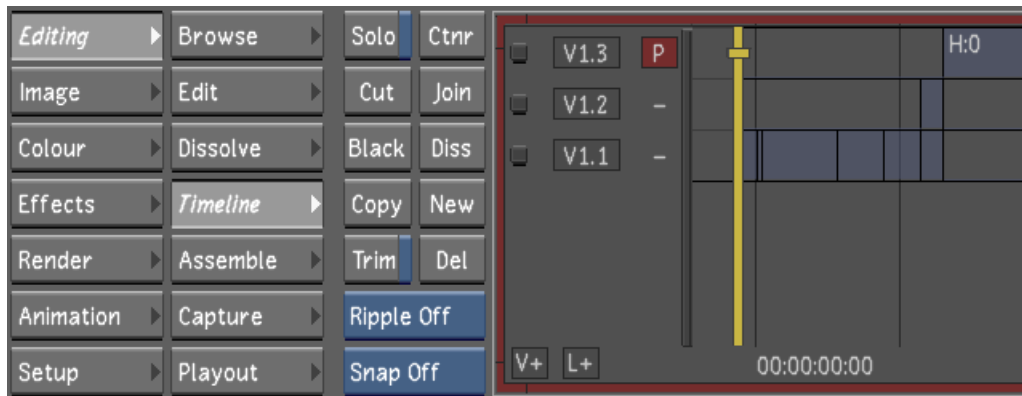
Timeline:view in LustreMulti-Layer TimelineThere are various areas to work with when you access the Timeline menu:

- Storyboard. See [Storyboard Viewing Options](#) (page 326).
- File browser. See [Accessing the File Browser](#) (page 203).
- Library. See [Accessing the File Browser](#) (page 203).
- Player and full-screen Player. See [The Player](#) (page 132).

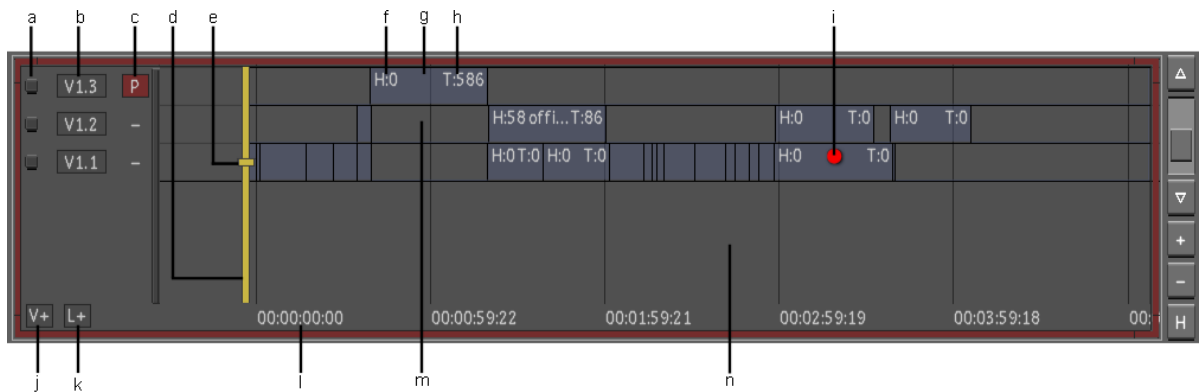
NOTE From the Timeline menu, you can press **Enter** to toggle through these different views.

To access the Timeline menu and multi-layer timeline:

- 1 In the Main menu, click Editing.
- 2 Click Timeline. The Timeline menu and the multi-layer timeline canvas appear.



The multi-layer timeline is made up of the following components.



(a) Layer selector (b) Track/Layer name (c) Primary Track/Layer indicator (d) Positioner (e) Track/Layer selector (f) Element Head (g) Element (h) Element Tail (i) Shot Priority indicator (j) Add Video Track button (k) Add Video Layer button (l) Starting timecode (m) Gap (n) Canvas

Layer selector Selects the entire layer in preparation for an operation.

Track/Layer name The name of the layer, where V stands for Video and L for Layer. Adding a layer generates V1L2, V1L3, etc.

Primary Track/Layer indicator Indicates which Track/Layer is set to Primary. Click the left side of the track (-) to set the track as Primary (P).

Positioner The play head for the Player. The frame directly beneath the positioner is displayed in the Player and is the current location for an edit. The positioner's location is reflected in the Source Timecode or Timeline Information field. See [Monitoring the Location of the Current Frame](#) (page 324).

Focus point When Solo mode is enabled, the focus point indicates the current layer and which layer is displayed in the Storyboard. When Solo mode is disabled, the top layer acts as the primary layer and is displayed in the Player and Storyboard. The focus point also determines to which layer a cut or dissolve is added. Together, the position of the focus point and the positioner is reflected in the Source Timecode or Timeline Information field. See [Monitoring the Location of the Current Frame](#) (page 324).

Element Head Number of available frames for trimming, succeeding a transition.

Element The media in the timeline.

Element Tail Number of available frames for trimming, preceding a transition.

Shot Priority indicator Graphical representation of a shot with priority. See [Shot Priority](#) (page 305).

Add Video Track button Adds a new Video Track to the timeline.

Add Video Layer button Adds a new Video Layer to the timeline.

Gap The absence of media. In a multi-layer context and when Solo mode is disabled, gaps are also transparent.

Canvas Click the canvas to zoom in/out and move the timeline.

The Timeline menu is made up of the following buttons.



Solo When Solo mode is enabled, Lustre displays, plays out to tape, or renders only the layer on which the focus point is positioned.

NOTE The Solo state is not saved in the grade file.

Cut Adds a splice at the positioner location on the focused layer.

Black Generates one second of black media that can be added to the timeline.

Copy Copies the current selected elements to the clip board. Copied elements are displayed in red. Drag and drop the copied elements to the destination timecode or layer.

Trim Trims the head and/or tail of an element.

Ripple mode Determines whether the length of the edit sequence is affected when new material is inserted into or removed from the timeline.

Snap mode Sets how elements are placed when gesturally moved or copied to the Timeline. Off drops the element at a chosen location (can overwrite another element); Trn snaps the element to the closest transition; Pos snaps the element to the positioner.

Ctnr Adds a container to the timeline.

Join Removes the splice on selected elements coming from the same source clip with consecutive source timecode.

Diss Adds a dissolve at the positioner location on the focused layer.

New Copies the current element to the next available top layer with grade data.

Del Deletes the current selection.

Timeline Navigation Controls

navigating;with Timeline navigation controlsTimeline:navigation controlsThe following is a list of hotkeys and mouse gestures commonly used to navigate within the Timeline menu.

Press:	To:
Right Alt	Go to the previous frame.
Right Ctrl	Go to the next frame.
Left arrow	Go to the previous element.
Right arrow	Go to the next element.
Up arrow	Move the focus point to the layer above.
Down arrow	Move the focus point to the layer below.
Middle mouse button and drag	Move the multi-layer timeline.
Right mouse button and drag	Zoom into or out of the multi-layer timeline.
Left mouse button and drag the positioner	Move the positioner.

Additional multi-layer timeline navigation controls are shown below.



(a) Scroll timeline canvas up (b) Vertical scroll bar (c) Scroll timeline canvas down (d) Vertical zoom control (e) Home/selected Focus view (f) Scrub area

Scroll timeline canvas up Displays the top layers located outside of the canvas view.

Vertical scroll bar Quickly moves the multi-layer timeline view up or down.

Scroll timeline canvas down Displays the bottom layers located outside of the canvas view.

Vertical zoom control Enlarges or reduces the size of the layers.

Home/selected Focus view Click this button to reset the vertical/horizontal zoom and position of the canvas view to display the entire timeline. **Alt +** press this button to zoom into the selected shot(s).

Scrub area Click or drag in this area to quickly move to any point in the timeline.

Viewing Element Information

Timeline: viewing element information It is possible to vertically expand the size of a layer to see more information about the element.

To vertically expand the layer:

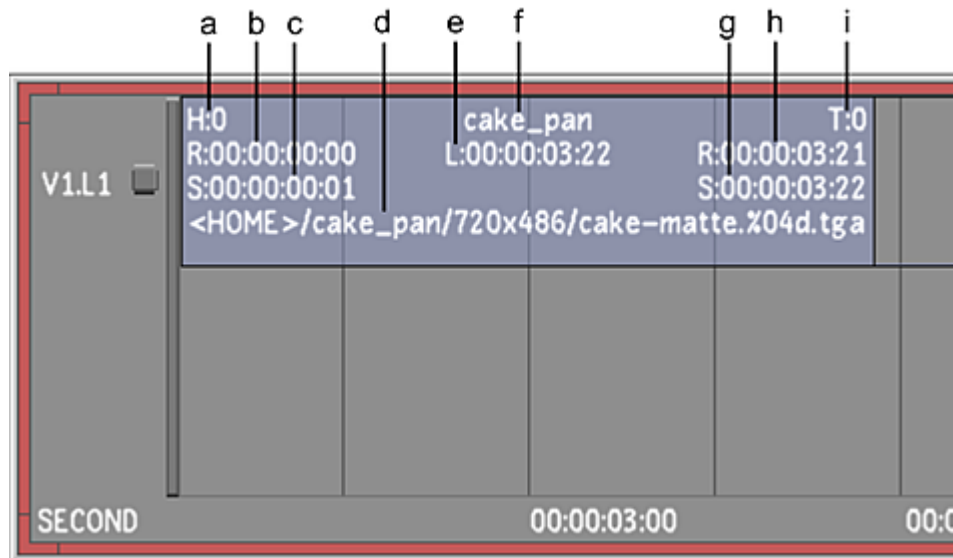
- 1 Click **+**.
More information about the element is revealed.

NOTE Each time you press **+**, more information is revealed.

To minimize the layer:

- 1 Click **-**.
Other layers become visible.

The following information is displayed about an element.



(a) Head (b) Start record timecode (c) Start source timecode (d) Shot location (e) Length of element (f) Name of element (g) End source timecode (h) End record timecode (i) Tail

Editing in the Timeline

editing:in TimelineTimeline:editingThe following sections describe how to perform various basic timeline operations.

Creating a Timeline

Timeline:creating When you add shots to the Storyboard view or assemble an EDL, Lustre creates a timeline. You can then perform editing operations or colour grade the sequence. A timeline can also be called a cut file.

Adding Shots to the Timeline

shots:adding in Timeline;Timeline:adding shots Timeline:adding shots to You can add shots by dragging and dropping from the Library or Browser to the multi-layer timeline or to the Storyboard. See [Adding Shots to the Storyboard](#) (page 259).

NOTE Snap and Ripple mode affects how shots are added to the timeline.

Interchange with Flame or Smoke

When dropping content, coming from a Smoke or Flame project to a Lustre timeline, the sequence or the clip is inserted as a layer above the current video layer or track, at the content's record timecode. This functionality is useful when importing revised editorial content from Smoke & Flame into the currently opened Lustre timeline.

NOTE In order to drop imported content from Wiretap server at its native record timecode, the selected sequence must be dropped directly from Media Browser to the current sequence. Dropping the selected sequence to the Media Library first, and then dropping this sequence into the current sequence will use the timeline Snap options (Off, Positionner or Transition) rather than its native record timecode.

Importing Timelines as Source Clips

Drag and drop timelines (clips with a red background) from the library to the Lustre timeline to build a timeline containing multiple conformed EDLs (for example, multiple scenes of a project).

You can drag and drop the timeline clips to the Storyboard or Timeline view:

- **Storyboard:** inserts the incoming timeline to the end of the current timeline on the primary track or layer, while preserving the video tracks and layers.
- **Timeline:** inserts the incoming timeline at the drop point or according to the defined Snap option. The layer where you drop the timeline(s) defines where a multi-layer timeline is created.

NOTE Grading metadata is not part of the timeline structure. Use Marry Grade to share grading data between timelines.

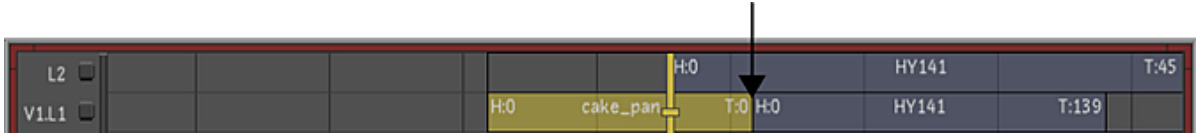
Snapping Elements

Timeline:snapping elements in;snapping elements;elements:snapping The snap mode (set in the Timeline menu at Main menu > Editing > Timeline) sets how elements are placed when gesturally moved or copied to the timeline.

Snap Off Drops the element at a chosen location.

NOTE An element can be overwritten if you drop one element over another.

Snap Trn Snaps the element to the closest transition.



Snap Pos Snaps the element to the positioner.



Selecting Elements

Timeline:selecting elements in;selecting elements;elements:selectingYou can select multiple elements to move, copy, or delete. Use the following modifier keys to create a selection.

To select elements in a continuous selection:

- 1 Click the first element in the selection.
- 2 Press **Shift** and click the last element.
All elements between the first element and the last element you clicked are selected.

NOTE This function only works within the same layer.

To select elements in a broken selection:

- 1 Press **Ctrl**.
- 2 Click the elements you want to select.
Various elements in broken sequence are now selected.

NOTE To remove elements from a multiple selection, press **Ctrl** and select the elements you want to remove from the selection.

TIP You can use **Shift** to define a selection on a layer and then hold **Ctrl** and start a new selection on another layer (with **Shift** or **Ctrl**).

Moving Elements

Timeline:moving elements in;moving elements;elements:movingYou can move an element or a selection of elements within the same layer or to another layer.

To move an element or a selection of elements within the same layer or to another layer:

NOTE The status of Ripple and Snap modes are taken into account when dropping elements. See [Trimming With Ripple Mode](#) (page 298) and [Snapping Elements](#) (page 282).

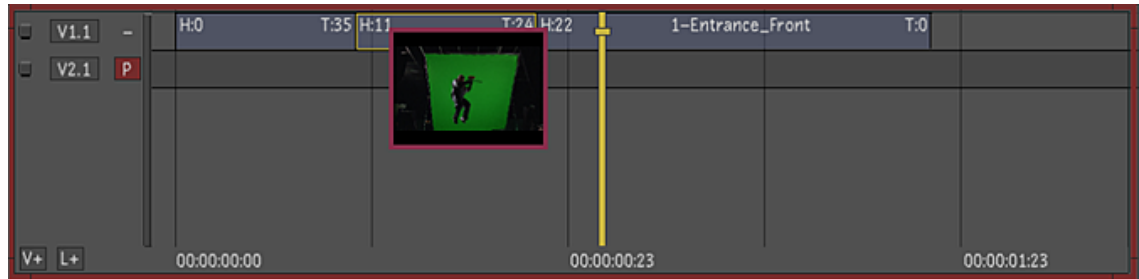
- 1 In the multi-layer timeline, select the element you want to move.
The selected element becomes yellow.

- 2 Drag the element and drop it at the destination.

Replacing Elements in the Timeline

You can now replace shots and select a timeline segment as the destination. The replaced shot starts at the location of the original shot and gap or tail handles appear to fill the original duration.

- 1 Load the timeline you want to modify.
- 2 In the library, press SHIFT key and select a clip. Release SHIFT key.
- 3 Move the selection over the timeline segment you want to replace and click on the segment.



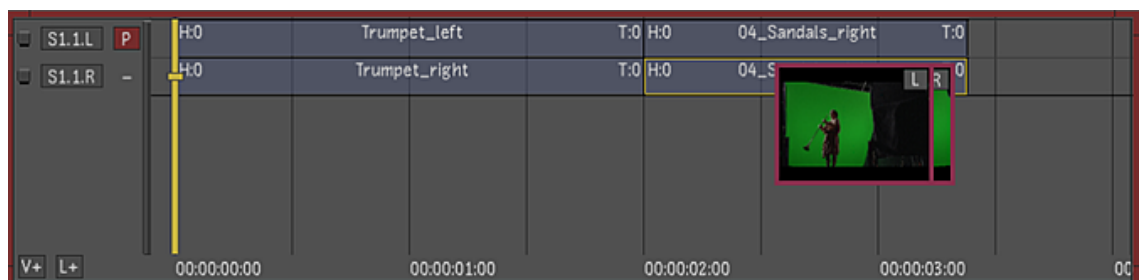
The shot is replaced and the grading on the original shot is preserved. Tail media or Gap is seen in the timeline if the shots don't have the same duration.

Replacing Shots in a Stereo Timeline

When working on a Stereoscopic project, you can perform a shot replace that applies to both eyes at the same time.

NOTE In Stereo, you must replace the shot for both eyes. It is not possible to use Replace Shot for only one eye.

- 1 Load the timeline you want to modify.
- 2 In the library, hold SHIFT key and select the Left clip. A "L" icon appears on the top right side of the thumbnail.
- 3 Navigate library to find the Right clip, hold SHIFT key and select the Right clip. A "R" icon appears on the thumbnail. Release SHIFT key.
- 4 Move the selection over the Storyboard or Timeline segment you want to replace and click on the thumbnail.



Both Left and Right shots have been replaced with the selection and the grading on the original shots is preserved.

Swapping Elements

Timeline:swapping elements in;swapping elements;elements:swappingYou can swap any two shot elements by selecting them in the timeline or Storyboard. The shots can be in different layers.

To swap shots within the same layer or between two layers:

NOTE When swapping elements, the status of the Ripple mode is always Ripple Off.

- 1 In the multi-layer timeline, select two shots. See [Selecting Elements](#) (page 283).
The selected elements become yellow.

WARNING If the shots do not have the same duration, the shot with the longer duration is trimmed, and the shot with the shorter duration is followed by a gap.

- 2 Press `Shift+'`.
The shot positions are interchanged.

Copying Elements

Timeline:copying elements in;copying:elements;elements:copyingYou can copy one or more elements within the same layer, or from one layer to another. In addition, when copying across layers, you can maintain a vertical lock on the shots you are copying to preserve their 'horizontal' place in the timeline.

NOTE The status of Ripple and Snap modes are taken into account when dropping elements. See [Trimming With Ripple Mode](#) (page 298) and [Snapping Elements](#) (page 282).

To copy elements within a layer:

- 1 In the multi-layer timeline, select the element(s) you want to copy. See [Selecting Elements](#) (page 283)
- 2 Click Copy.
The copied element(s) become red.
- 3 Drag the elements to a new position in the timeline.
- 4 Click the mouse button to complete the copy.

To copy a single element from one layer to another layer:

- 1 In the multi-layer timeline, select the element you want to copy.
- 2 Click Copy.
The copied element becomes red.
- 3 Position the cursor over the element you wish to copy and click and hold the left mouse button.
NOTE To maintain a vertical lock on the copied element, hold down the `Shift` key.
- 4 Drag the element to the desired layer and horizontal time position.
- 5 Release the mouse button (and the `Shift` key, if required) to complete the copy.

To copy multiple elements from one layer to another layer:

- 1 In the multi-layer timeline, click once on the far-left element you want to copy in the layer.
- 2 Select the remaining elements you want to copy. See [Selecting Elements](#) (page 283).

- 3 Click Copy.
The copied elements become red.
- 4 Position the cursor over any of the elements you wish to copy and click and hold the left mouse button.
NOTE To maintain a vertical lock on the copied elements, hold down the `Shift` key.
- 5 Drag the elements to the desired layer and horizontal time position on the Timeline.
- 6 Release the mouse button (and the `Shift` key, if required) to complete the copy.

Adding Black Media to the Timeline

black media, adding to the TimelineTimeline:adding black media toYou can add black media to the timeline to create a space (or fades) between elements. By default, a black clip is one second in duration, based on the project's frame rate.

To add black media to the timeline using the Storyboard, see [Adding a Virtual Black Clip using the Storyboard](#) (page 276).

To create black media:

- 1 In the Timeline menu, click Black.
A black shot appears attached to the mouse cursor.
- 2 In the timeline, position the cursor of the black shot where you want the black media to appear.
NOTE The status of Ripple and Snap modes is taken into account when adding black media.
- 3 Click the mouse button to drop the shot.
The black media is now in place.

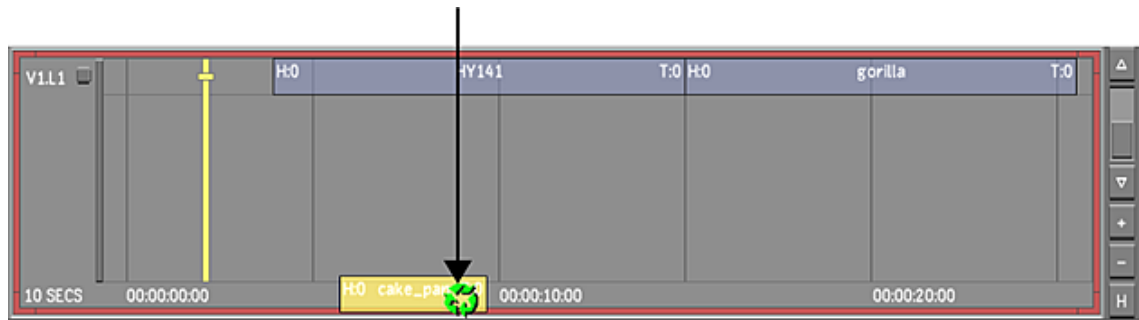
Deleting Elements

Timeline:deleting elements in;deleting elements;elements:deletingYou can delete selected elements in the timeline in numerous ways.

NOTE Deleting an element is affected by the Ripple mode. For example, if Ripple Off is enabled, deleting a shot leaves a gap.

To delete the element(s) from the timeline:

- 1 Select the element(s). See [Selecting Elements](#) (page 283).
- 2 Do one of the following:
 - Click Del, and then confirm the deletion.
If no selection is made, the element with focus is deleted.
 - Press `Shift+D`.
If no selection is made, the element with focus is deleted.
 - Drag the selection outside the red border of the Timeline. When the recycle symbol appears, drop the element(s) to delete it.



NOTE You can also delete shots in the Storyboard view. See [Deleting Shots](#) (page 261). The Timeline immediately reflects the changes.

Gaps in the Timeline

Timeline:gaps, overview A gap is an empty space in the timeline. On a single layer, a gap is displayed as a hole in the multi-layer timeline. A red X is displayed in the Player when the positioner is located on a gap. Gaps are also displayed as 'GAP' in the Source Timecode field.

When working with a multi-layer timeline, a gap located on the top layer shows the elements located below (Solo mode disabled only).

Gaps can be modified like other clips. They can be trimmed by using Ripple Start and Ripple End mode (see [Trimming Ripple Mode](#) (page 299)). Their length can also be increased or decreased by modifying the clips around them. Gaps can be selected, copied, or deleted.

Working With Containers, Matte Containers and Multi-channel Clips

Containers, matte containers and multi-channel clips are a convenient way of grouping elements on the timeline. They can each be represented in the timeline as a single element.

- A [container](#) (page 288) is composed of multiple versions of the same shot with different grades or multiple shots.
- A [matte container](#) (page 290) is composed of a primary track and one or more external mattes.
- A [multi-channel clip](#) (page 292) is a source clip that contains one or multiple matte channels.

Note the following functionality while working with containers, matte containers, and multichannel clips:

- Containers, matte containers and multi-channel clips can be part of a sorted selection. When a timeline is sorted, it is not possible to enter inside the containers.
- You can apply retime effects on containers, matte containers and multi-channel clips. All shots inside a container get the same retime effects. When you drag and drop clips to a container, the shots you add also get the same retime effect.
- You can collapse a selection of shots, containers, matte containers and multi-channel clips. When the timeline is collapsed, the matte media in matte containers and multi-channel clips are still available for grading, but you cannot enter inside these timeline segments when they are collapsed.
- You can remove containers and matte containers on multiple selections.

Matte Workflow

You can import mattes like any other source clip. Use one of the following workflows with externally generated mattes:

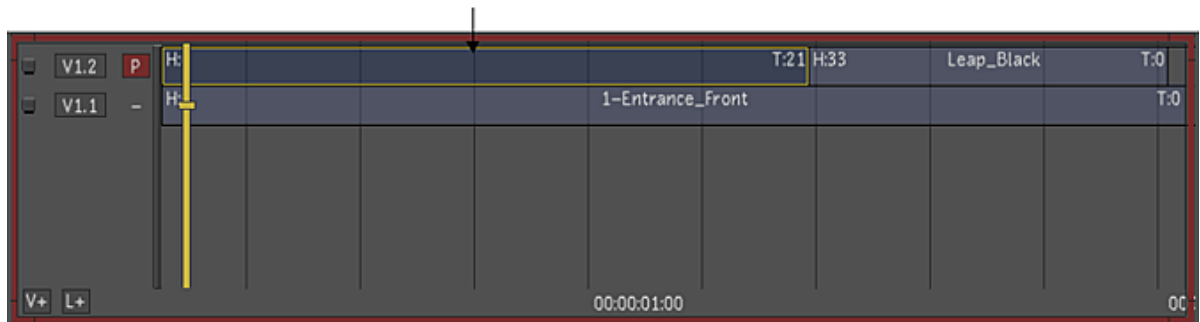
- Use a matte container created in Lustre and import a matte as a source clip.
- Use multi-channel clips when you want to add matte channels to a source clip and share this footage with multiple timelines in Lustre. These clips can be created from Lustre or generated outside the application using the Autodesk Wiretap Gateway XML schema.
- Use a matte container created in Smoke and Flame through Wiretap.

NOTE The legacy external matte workflow that required the manual modification of matte files to match the source footage file name and location is now obsolete. You cannot load mattes that were created prior to Lustre 2012. You must recreate them.

About Containers

Use containers to store multiple versions of the same shot with different grades or multiple shots. Grading is applied on the shots inside the container and not on the result of the container.

Containers on the timeline are dark grey in colour:



On the storyboard, a dark grey box on the left corner of the thumbnail indicates a container:



Inside a container you can work with video tracks and layers:

- When working on layers inside the container, you can perform any editorial task, add versions and use Shot Priority to define the output of the Container.

NOTE Do not use Solo on layers inside a Container to define the container output because Solo is not saved with the grading data. Use Shot Priority instead.

To create a container:

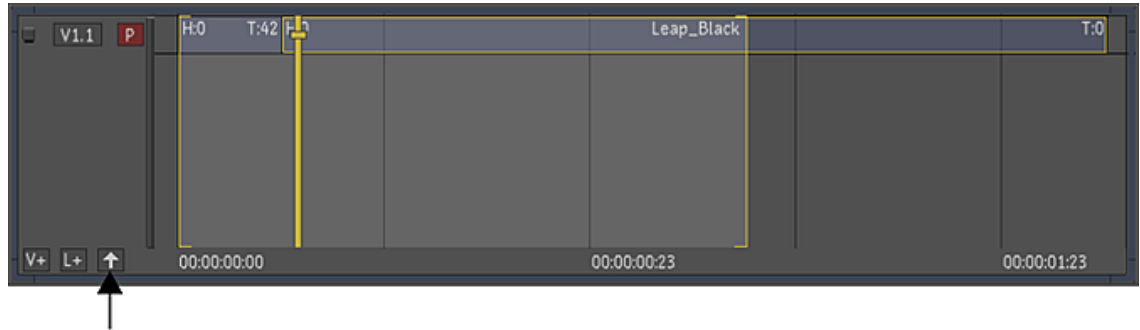
- 1 Select one or more timeline segments.
- 2 Click the Ctnr button.
Container segments/elements appear dark grey in the record timeline.

To enter a container:

- 1 Double-click the container segment.
The contents of the container are displayed.

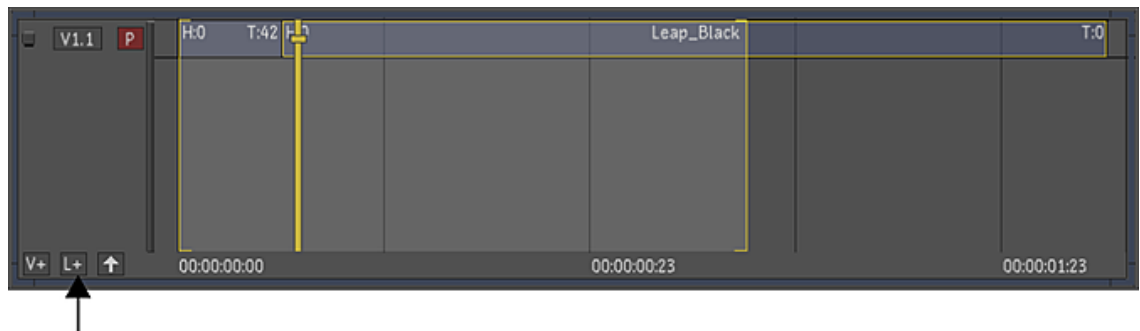
To exit a container:

- 1 Click the Up Arrow button (next to L+ button, located at the bottom left side of the timeline).
The contents of the container are collapsed into a single segment.



To add a clip to a layer in a container:

- 1 Double-click the container to open it.
- 2 Click L+ to add a new layer.



- 3 Select the clips from Library.
- 4 Drag the clips to the layer in the container.

Use containers to hold multiple versions of grading on a shot.

To create a new version of the grading without entering the container:

- 1 Hold down the **Ctrl** key and click the New button.
A new version on vertical layer appears inside the container.

To remove a container:

- 1 Place the positioner on the container, or select the container.
The selection overrides the positioner.
- 2 Hold down the **Alt** key and click the Ctnr button.
The container is removed and the container contents are inserted on the current timeline.

About Matte Containers

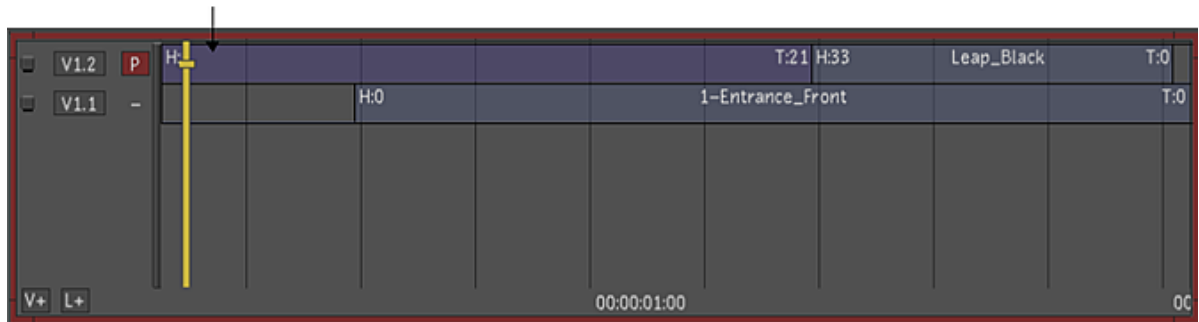
Use matte containers to perform secondary colour grading and effects with externally generated mattes.

Matte containers are composed of timeline segments that contain two video tracks:

- The primary video track contains the shot.
- The secondary video track contains the matte. Use the matte for secondary colour grading and effects.

It is possible to build complex multi-layered content inside a matte container. However, only the source media of the matte track is used for secondary colour grading. Effects created on the matte, including dissolves, are not used in secondary colour grading.

Matte containers on the timeline are purple:



On the storyboard, a purple box on the left corner of the thumbnail indicates a matte container:



If there is a gap or virtual colour clip on a matte track and an external matte is enabled (R/G/B/A buttons), the matte is seen as opaque (black) so any correction will not be seen on the graded image. This behavior is also true for multi-channel clips where no matte media is available (displayed as gap).

You can create matte containers from both monoscopic and stereoscopic media.

To create a matte container:

- 1 Select one or more timeline segments.
- 2 Press Ctrl and click the Ctnr button.
The segment turns purple to indicate that you have created a matte container.

To change a video track inside a matte container from Primary to Secondary:

- 1 Do one of the following:
 - Click the left side of the video track (-) to make it Primary (P).
 - Middle-mouse-click on the left side of the track or channel (-) to make it Secondary (S).

Enter, exit and remove a matte container in the same manner as a container.

Adding a Matte to a Matte Container

There are two ways to add a matte to a matte container.

- By entering the matte container and adding the matte to a video track.
- Adding a clip from the library to the timeline without entering the matte container directly.

The matte clip must have the same resolution as the front clip in a matte container.

To enter a matte container and add a matte to it:

- 1 Display the timeline and the library.
- 2 On the timeline, double-click the matte container to enter it.
- 3 Click V+ to add a new track.
- 4 Drag and drop a clip from the library to the track on the timeline.
- 5 (Optional) Set the matte as the secondary.

To add a matte to a matte container without entering it:

- 1 Display the timeline and the library.
- 2 Select the matte you want to add to the container from the library.
- 3 Press Ctrl, drag and drop a matte onto the matte container segment on the timeline to insert the matte at the first frame of the first shot inside the matte container.
- 4 (Optional) You can drag and drop a matte onto the matte container while holding Ctrl+Alt to insert the matte at the first frame of the In point of your timeline segment rather than the first frame of the source clip. This is useful when working with scene detected footage requiring mattes.

NOTE The Ctrl+Alt option is exclusive to Lustre 2012 Extension 1.

You can drag and drop multiple mattes into a matte container. The first matte you add is the secondary track. You can apply any matte in your container to a separate secondary colour grading layer in the Colour | Secondaries menu. See [Selecting a Matte to Grade Secondary Layers](#) (page 291).

To add a matte to a stereoscopic matte container, you must drop mattes one at a time to add them to the matte container. You cannot select both a left and right matte at the same time and drop them on a clip to create a stereo matte container.

To add a matte to a stereoscopic matte container:

- 1 Display the timeline and the library.
- 2 Hold down Ctrl or Ctrl+Alt and drag and drop a matte onto the matte container segment that corresponds to the stereo eye.
- 3 Hold down Ctrl or Ctrl+Alt and drag and drop a second matte onto the matte container segment that corresponds to the other stereo eye.

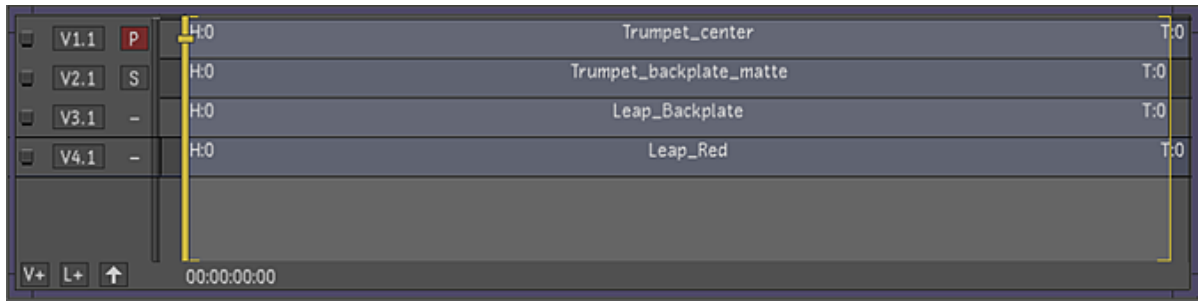
NOTE The Ctrl+Alt option is exclusive to Lustre 2012 Extension 1.

Selecting a Matte to Grade Secondary Layers

By default, the Secondary track in a matte container or multi-channel clip is selected for grading.

You can select a different matte track or channel for each secondary layer of colour grading. This is useful when you want to grade the image based on the values in its colour channels. You can make this change from the Colour | Secondaries menu, rather than going into the matte container on the timeline.

Here is a matte container with 3 matte tracks, V2.1 is set as the secondary.



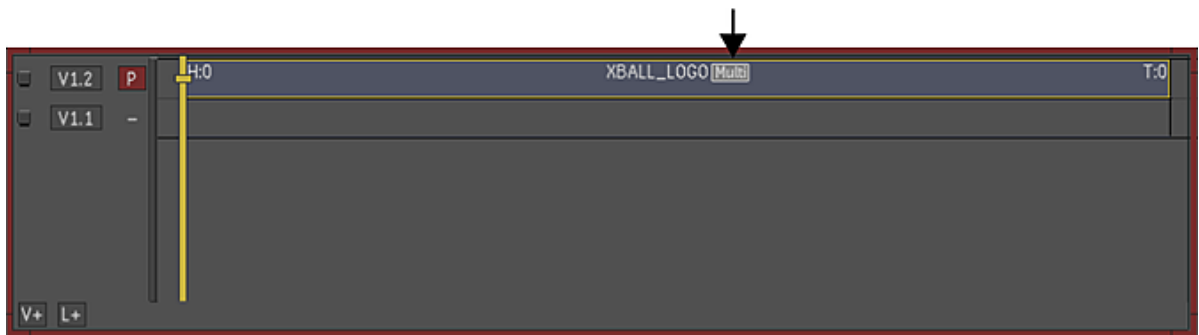
In the Secondaries menu, you can enable a different matte for each secondary layer. Enable a secondary. Then click the Matte button and select the matte track to apply to the secondary.

See [Working with Mattes](#) (page 499).

About Multi-channel Clips

A multi-channel clip is a source clip that contains one or multiple matte channels. Add matte media to source clips in the Lustre timeline to create a multi-channel clip and use the matte for secondary colour grading and effects. See [Working with Mattes](#) (page 499).

On the timeline, the multi-channel clip is labelled Multi.



On the storyboard, the multi-channel clip is labelled Multi.



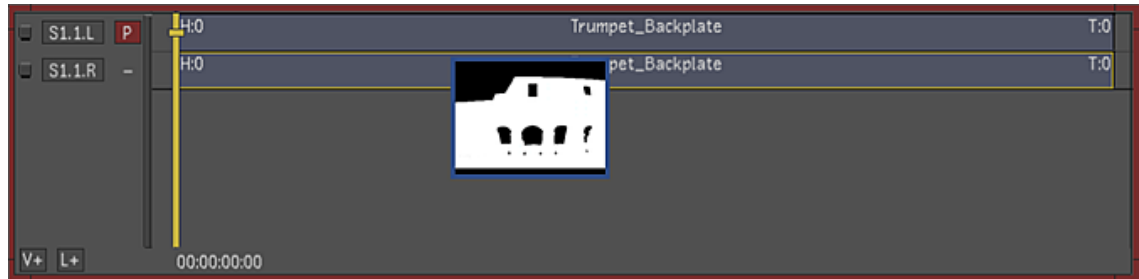
When you create a multi-channel clip, the source clip is modified in the library. Next time you use the source clip, the matte will be available. Any modification done inside the multi-channel clip is replicated in the library source clip.

NOTE When rendering a timeline that contains multi-channel clips from Lustre to Smoke or Flame, a matte container is created.

The front and the matte clip can be different file types or bit depth, but they must have the same resolution to create a multi-channel clip.

To create a stereoscopic multi-channel clip:

- 1 Add the left and right source media to the stereo timeline.
- 2 Hold Ctrl and drag the matte clip from the library and drop it on the source media on the timeline that corresponds to the stereo eye.

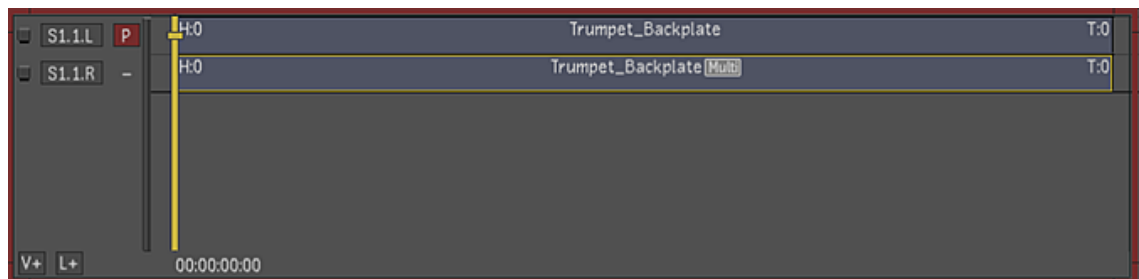


TIP Dragging and dropping while holding Ctrl drops the matte at the first frame of the source clip. Holding Ctrl+Alt while dragging and dropping inserts the matte at the first frame of the In point of the desired timeline segment.

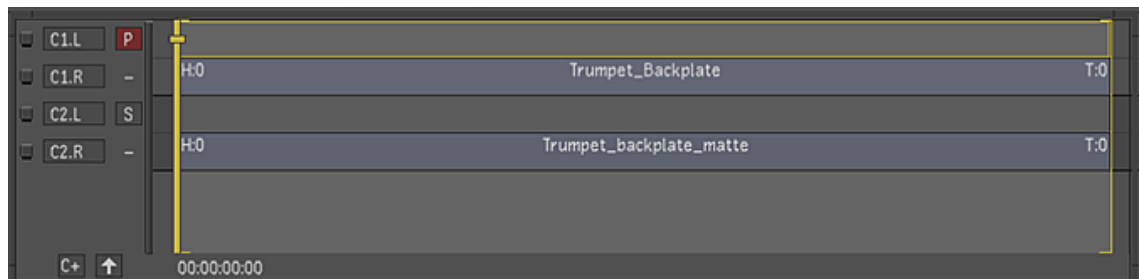
NOTE The Ctrl+Alt option is exclusive to Lustre 2012 Extension 1.

Dragging and dropping while holding Ctrl drops the matte at the first frame of the source clip. Holding Ctrl+Alt while dragging and dropping inserts the matte at the first frame of the In point of the desired timeline segment. The Ctrl+Alt option is exclusive to Lustre 2012 Extension 1.

A "multi" icon appears on the Stereo timeline segments, but only one of the stereo sources is updated in the Library.

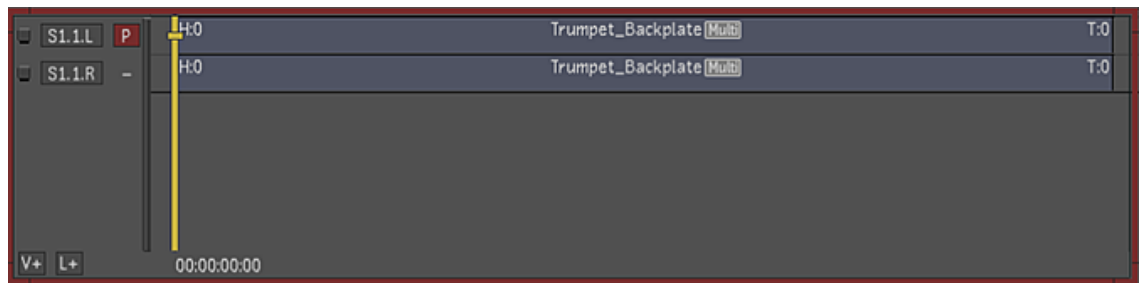


If you open the multi-channel clip, you see that the channels for the other eye are empty.

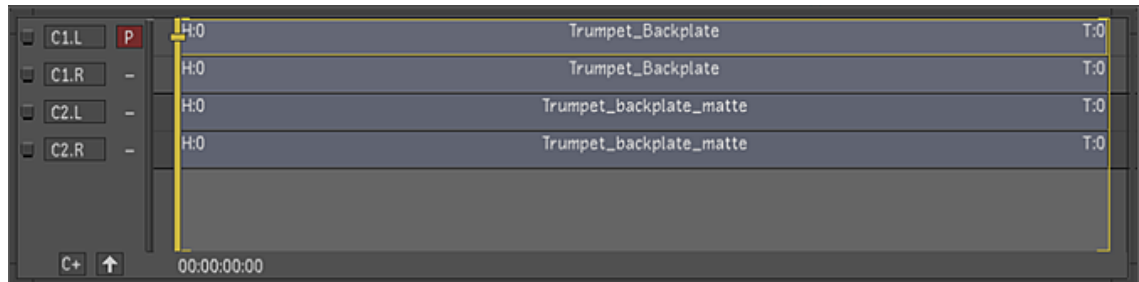


- 3 Hold Ctrl and drag the other matte clip from the library and drop it on the source media on the timeline that corresponds to the other stereo eye.

A "multi" icon appears for the other stereo source in the library.



If you open the multi-channel clip now, you see that the front and matte clips for both.



NOTE When creating a stereoscopic multi-channel clip, you must drag and drop a left clip to the left eye and a right clip to the right eye in the timeline so that each segment is identified as multi-channel. Lustre does not support stereoscopic eyes that are in different states.

To enter a multi-channel clip:

- 1 Double-click the multi-channel timeline segment.
The matte media is located on the Secondary video channel (C2).

To convert a multi-channel clip to a standard source clip:

- 1 Delete all channels from C2 and up.
- 2 Exit the multi-channel clip.

Edit the Timing of a Matte in a Multi-Channel Clip to Match the Source Clip

Timing modifications done inside a multi-channel segment are saved in the source clip in the library. All instances of that source clip are updated to use the new timing.

You can only slip a shot to adjust its timing. You cannot trim.

To protect the structure of the source footage, it is not possible to add dissolves or layers inside the multi-channel clip. Use matte containers for more complex editing.

To create a temporary grade to help you set the timing of a matte in a multi-channel clip:

- 1 Exit the multi-channel clip on the timeline.
- 2 Enable a Secondary.
- 3 Enable one of the External Matte channels (R/G/B/A).
- 4 Modify the grading so that you can see the matte media over the image.
- 5 From the Timeline menu, enter the multi-channel clip.

- 6 Slide the clip in the timeline to change the timing. Use the display of the matte over the shot to help you find the right starting frame.
- 7 Click the Up arrow to exit the multi-channel segment. You are now ready to grade your shot.

Multi-Channel Clip Management

Automatic Creation of Multi-Channel Clips with Matte / MultiMatte Folder Structure

You can create folder structures that automatically generate Multi-Channel clips and automatically add and sync the matte media located in the *matte/multimattes* folder to the source clip. If there is a *matte/multimattes* folder located within the resolution folder of the source media files, Lustre displays the source clip as a Multi-Channel clip.

NOTE Grade files created with pre-2012 versions of Lustre and using external mattes are converted to Multi-Channel clips and can be imported in Lustre 2013.

Matte media files must have the following attributes:

- The index (frame numbers), in the source/mattes file names have to match. You can have any number of characters before the frame number value, as long as the frame numbers at the end of the filename match, they will be compatible. For example, *shot1_10000.dpx* is compatible with *000010000.tif* as well as with *lustrematte10000.tif*.
- The matte media files must be of the same resolution as the clip.
- The mattes must be either RGB or RGBA files.

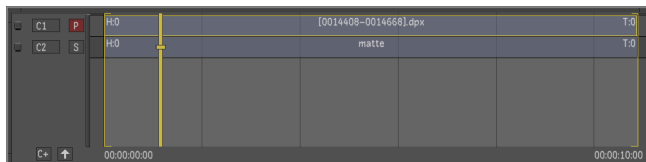
Single Matte Media Structure

Here are some examples of media structures that Lustre uses for automatic Multi-Channel clip creation with a single matte.

Simple source clip (one clip in one folder):

- `/scans/project/0001/1920x1080/[10000-10100].dpx`
- `/scans/project/0001/1920x1080/matte/[10000-10100].tif`

The resulting clip in Lustre displays as a Multi-Channel clip that has a matte channel spanning all the frames of the source clip.



NOTE When Lustre creates a Multi-Channel clip, the matte channel has the same duration as the source clip. If the matte media does not cover the full duration of the source clip, the portions without matte media is seen as opaque when in the "O" view. As a result of this, the secondary grading cannot be displayed.

Simple source clip (one clip in one folder) with partial matte media:

- /scans/project/0001/1920x1080/[10000-10100].dpx
- /scans/project/0001/1920x1080/matte/[10040-10055].tif

The resulting clip in Lustre displays as a Multi-Channel clip that has a matte channel spanning frames 40 to 55. The matte channel still covers the entire duration of the source clip but secondary grading is not visible on the portions of the clip where there is no matte media even if the RGBA Matte buttons are enabled.

Multiple source clips located in a single folder:

- /scans/project/0001/1920x1080/[10000-10100].dpx
- /scans/project/0001/1920x1080/[20000-20100].dpx
- /scans/project/0001/1920x1080/[30000-30100].dpx
- /scans/project/0001/1920x1080/matte/[10000-10100].tif

In this source clip structure, multiple source clips are located inside a single folder along with a *matte* folder but it only contains matte files for the first sequence that has the frame range of 100000-10100.

The media files that do not have matte files with a corresponding frame range are read as standard source clips.

Multiple Mattes Media Structure

You can create a folder structure to store multiple matte clips by creating a *multimattes* folder instead of *matte*. The *multimattes* folder must contain a subfolder for each matte sequence to be included in the multi-channel clip, as in the example below:

Simple source clip (one clip in one folder) with multiple matte media:

- /scans/project/0001/1920x1080/[10000-10100].dpx
- /scans/project/0001/1920x1080/multimattes/matte1/[10000-10100].tif
- /scans/project/0001/1920x1080/multimattes/matte2/[10000-10100].tif
- /scans/project/0001/1920x1080/multimattes/matte3/[10000-10100].tif

This structure creates a 4-channel Multi-Channel clip (media + 3 mattes) with a matte on channels 2, 3 and 4.

NOTE The *multimattes* subfolders do not have to conform to any particular naming convention. You can name the *multimattes* subfolders as you like. Lustre sorts the subfolders and the mattes in alphanumeric order.

Simple source clip (one clip in one folder) with "matte" and "multimattes" structure:

You can also mix and match the *matte* and *multimattes* structure, as in the example below:

- /scans/project/0001/1920x1080/[10000-10100].dpx
- /scans/project/0001/1920x1080/matte/[10000-10100].tif

- /scans/project/0001/1920x1080/multimattes/matte1/[10000-10100].tif
- /scans/project/0001/1920x1080/multimattes/matte2/[10000-10100].tif
- /scans/project/0001/1920x1080/multimattes/matte3/[10000-10100].tif

This structure creates a 5-channel Multi-Channel clip (media + 4 mattes) with a matte on channels 2, 3, 4 and 5.

Synchronizing an Existing Cut and Source Clips with Newly Added / Removed Matte Media

When working on a project, it may happen that the matte media files located in *matte* and *multimattes* folder are modified (edited, added or deleted). In this case, Lustre can synchronize the cut or grade file and the source clips with the external matte files.

To synchronize the cut or grade file and source clips with the external matte files:

- 1 Select the Cut to update from the Cut List or the Grade to update from the Grade List.
- 2 Hold the Shift key.
- 3 Click Load.

Lustre synchronizes the shots in the Timeline and the clips in the Library with the content of the *matte* / *multimattes* folders. It then updates the clips, converting them to multi-channel when mattes are present or leaving them as single-channel when no mattes are found.

OpenEXR and External Mattes

You can create multi-channel OpenEXR files (multiple channels embedded in the OpenEXR file) that are displayed as multi-channel clips in Lustre. You can also use OpenEXR files with a *matte* / *multimattes* folder structure to automatically generate a multi-channel clip. When working with multi-channel OpenEXR files with an external *matte* / *multimatte* folder, you must always manually resync the cut / grade to have access to the matte channels. To do this:

- 1 Import your multi-channel OpenEXR clip.

NOTE At this stage, only the embedded RGB mattes are available.

- 2 Save your cut/grade.
- 3 Press Shift on the keyboard and load your cut or your grade.

All embedded and external mattes are now available.

It is also possible to update clips when external mattes are added from the file system. When you import a clip (locally or via Wiretap Gateway), and Matte media has been added in the Matte or Multi Matte structure, you can hold Shift when loading a Cut or a Grade and the clips and cuts are updated to reflect the newly added channels. This enables the following operations:

- Converting regular clips to Multi-Channel clips.
- Adding/Modifying Multi-Channel clips (addition, modification or removal of channels).

Trimming Elements

trimming:elementselements:trimmingTrimming adds head or tail frames to the element or subtracts head or tail frames from the element. You can trim using the trim cursors in the timeline canvas. For a specific trim cursor to appear, you must place the cursor over the required position within the element (i.e., head, tail, or middle section of the element). For example, when you place the cursor over the start of the element (the head), the trim head cursor appears.

The following editing changes are automatically updated in the Player:

- trimming
- slipping
- sliding

NOTE You can also access some of the multi-layer timeline features through the Colourist's Timeline. See [Colour Grading Basics](#) (page 395).

Trimming Cursors

trimming:cursors in the TimelineTimeline:trimming cursorsThe following cursors are used when trimming or slipping and sliding an element.

Cursor	Cursor name
	Trim head cursor
	Trim tail cursor
	Slip cursor
	Slide cursor
	Slip & slide cursor

Trimming With Ripple Mode

trimming:with Ripple Mode in the TimelineTimeline:trimming with Ripple ModeWhether Ripple mode is enabled or disabled it determines how the elements are trimmed. When Ripple mode is disabled, the overall duration of the sequence does not change when trimming. When you remove frames from the head or tail, it creates a gap (see [Gaps in the Timeline](#) (page 287)). If there is an element located before of after the trimmed element, only a head or tail trim is possible. To slip & slide an element with Ripple mode disabled can only be done if there are handles at the head and/or tail of the shot. See [Slip & Slide](#) (page 300).

When Ripple mode is enabled, the overall duration of the sequence changes when trimming. Removing frames from the head or tail does not create a gap and the elements located before or after the trimmed

element move in time (based upon the Ripple Start or Ripple End mode). You can slip & slide an element with Ripple mode enabled on any element when there are available handles.

NOTE If a layer is soloed, the Edit tools (Trash, Delete, Trim In/Trim Out, and Mark In/Out) default to 'Ripple End' behaviour, regardless of the Ripple Mode setting. If no layer is soloed, however, the Edit tools behave according to the individual Ripple Mode selected (Ripple Off, Ripple Start, or Ripple End) and apply to the active or visible layer that contains the focus point. For more information about Ripple Modes, see [Trimming Ripple Mode](#) (page 299).

To trim an element:

- 1 Enable Trim.
- 2 Select a Ripple mode (i.e., Ripple Off, Ripple Start, or Ripple End). See [Trimming Ripple Mode](#) (page 299).
- 3 Set the cursor on either the head or the tail of the element and the corresponding head or tail cursor appears.
- 4 Click and drag the element.
 - Dragging the element in the same direction of the head or tail cursor adds frames to the element.
 - Dragging the element in the opposite direction of the head or tail cursor removes frames from the element.

Trimming Ripple Mode

There are three types of Ripple mode when trimming.

Ripple Off Trimming does not affect the duration of the timeline.

Ripple Start Trimming moves in time the element located before the trimmed element.

Ripple End Trimming moves in time the element located after the trimmed element.

Slipping an Element

Timeline:slipping an elementSlipping simultaneously trims the head and tail of the element without changing its position in the sequence. The duration of the shot is not altered. Other elements in the edit sequence are not affected and the total duration of the sequence does not change. You can slip a single element or a selection.

NOTE Slipping is a non-rippling action.

To slip an element:

- 1 Enable Trim.
- 2 Position the cursor on the middle of the element that you want to slip.

The slip & slide cursor appears.



- 3 Press the , (comma) key.

The slip & slide cursor changes to a slip cursor.



- 4 Click and drag the element right or left.



Sliding an Element

Timeline:sliding an element Sliding changes a shot's position in the edit sequence without changing the head or the tail frames. It simultaneously slides the shot under the cursor and trims the head and tail of the surrounding gaps.

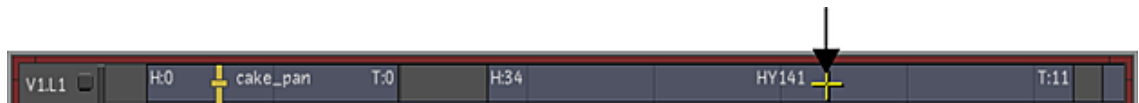
NOTE Sliding can only occur if there is a gap before and/or after the element.

You can slide an element or a transition. See [Transitions](#) (page 301).

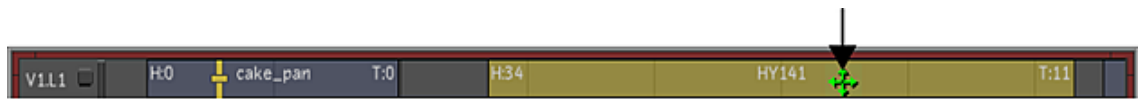
NOTE When you slide the first or last segment of the element, it changes the total length of the sequence. When you slide the middle of the element, the sequence does not ripple.

To slide an element:

- 1 Disable Trim.
- 2 Position the cursor on the middle of the element that you want to slide.



- 3 Click the element.
The slide cursor appears.



- 4 Drag the element right or left.



Slip & Slide

Timeline:slipping-and-sliding an element Slip and slide changes a shot's position in the edit sequence, as well as the head and tail frames. The media of the element stays at the same position in the sequence, but the location of the element changes.

NOTE Slipping and sliding can only occur if the element has available handles.

To slip and slide an element:

- 1 Click Trim.
This enables the Trim mode.
- 2 Position the cursor on the middle of the element that you want to slip & slide.
The slip & slide cursor appears.
- 3 Click and drag the element right or left.

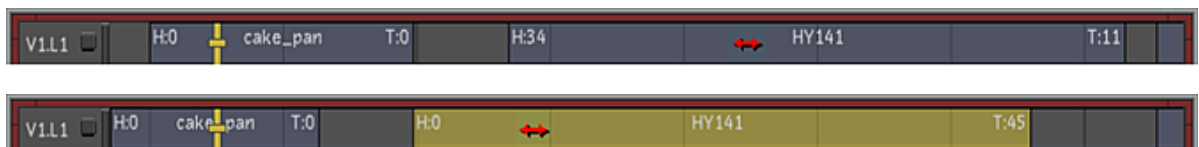
Slip & Slide Ripple Mode

Timeline:slip-and-slide Ripple Mode There are three types of Ripple mode when you slip and slide.

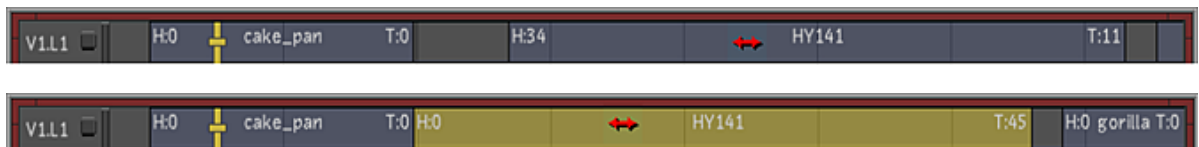
Ripple Off With Ripple Off, only the first and last shot of the Timeline and any shot surrounded by a gap, can slip and slide. The slip & slide operation adds a gap and changes the length of the edit sequence.



Ripple Start The slip & slide operation moves in time the element located before the trimmed element and inserts a gap after the slip & slide element.



Ripple End The slip and slide operation moves in time the element located after the trimmed element and inserts a gap before the slip & slide element.



Transitions

Timeline:transitions A transition is a way to go from one element to another. There are two types of transitions:

- Splices
- Dissolves

Splices

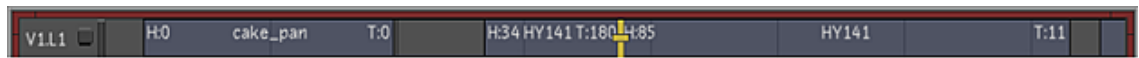
splicing:by adding a shot to the Timeline Timeline:splices When you add a shot to the Timeline, it automatically creates a splice. A splice is where one element ends and the following element begins, creating a hard transition. It is also possible to add a splice to an element in the Timeline to divide the element into two sections. You can remove a splice from an element, creating a continuous element.

To add a splice:

- 1 Click and drag the focus point to the layer you want to splice.
- 2 Move the positioner to the exact location of the element you want to splice.



- 3 Click Cut.
A splice is added.



To remove a splice:

- 1 Place the positioner on the right-most (also known as the B) side of the previously cut shot.
- 2 Click Join.

NOTE You cannot join elements coming from two different shots. You can join two shots coming from the same source clip with consecutive source timecode.

Dissolves

dissolves:in the TimelineTimeline:dissolvesA dissolve is the blending of two elements over a defined period of time. By default, Lustre adds a dissolve centred over the transition. You can slide the dissolve to make it start before or after the transition.

Also by default, a dissolve is set to be one second, based upon the project's frame rate (e.g., 24, 25, or 30 frames per second). You can change the duration by trimming the dissolve or by using the dissolve duration field in the Edit menu.

When you are working with multiple layers, elements located on the top layer can dissolve to a gap that reveals the content located on the bottom layer, therefore creating the equivalent of a dissolve between two shots.

Adding a Dissolve

Timeline:adding a dissolve indissolves:adding in the TimelineThere are two ways to add a dissolve to the upcoming transition of the layer under Focus.

To add a dissolve:

- 1 Place the focus point and positioner on top of the A-side of the transition where you would like to create your dissolve.
- 2 Do one of the following:
 - Click Diss.
 - Press D.

A dissolve is centred over the transition.



WARNING When building Timelines with multiple layers and transitions from layer to layer, avoid dissolving from a shot to a dissolve located on another layer. Dissolve only from a shot to a shot, otherwise, Lustre displays a red 'X'.

Removing a Dissolve

Timeline:removing a dissolve indissolves:removing in the TimelineYou can remove a dissolve from the Timeline.

To remove a dissolve:

- 1 Select the dissolve, or multiple dissolves.
The dissolve turns yellow.
- 2 Do one of the following:
 - Press **Shift +D**.
 - Click **Del**.

Editing a Dissolve

Timeline:editing a dissolve indissolves:editing in the TimelineThere are a couple of ways to change the duration of a dissolve.

To change the duration of the dissolve:

- 1 Right-click and drag the timeline to make sure the right dissolve is showing.
- 2 Place the positioner on the dissolve you want to modify.
NOTE The positioner needs to be located before the dissolve.
- 3 Click **Edit**.
The **Edit** menu appears.
- 4 Drag the Dissolve slider to set the dissolve duration. See [Changing Dissolve Duration](#) (page 273).

To change the duration of the dissolve using Trim mode:

- 1 Enable Trim.
- 2 Click and drag the dissolve using the Trim Head or Trim Tail cursor.

Changing the Orientation of a Dissolve

Timeline:changing orientation of a dissolve indissolves:changing orientation in the TimelineBy default, Lustre adds a dissolve centred over the transition, but you can change the orientation of the dissolve. See [Editing a Dissolve](#) (page 303).

To change the start/end point of the dissolve:

- 1 Enable Trim.
- 2 Move the cursor over the dissolve you want to modify. The slip & slide cursor appears.
- 3 Click and drag the dissolve to its new position.

NOTE When you add a dissolve, make sure there are enough handles for the duration of the transition. If you add a dissolve over a transition between two elements that do not have head/tail frames, the dissolve goes from the outgoing element to black and from black to the upcoming element. Trimming or slipping the elements may help solve the problem.

Displaying the Multi-Layer Timeline

Multi-Layer Timeline:Top Vertical PriorityTimeline:displaying Multi-Layer TimelineWhen there are multiple layers and you display footage in the Player, or play out to tape, or render, Lustre's default behaviour (called Top Vertical Priority) is to display the visible shots from a top-down view of the flattened timeline. This behaviour is further customized by muting layers and prioritizing individual shots. It is also possible to override Top Vertical Priority by soloing a single layer, which forces Lustre to display, play out to tape, and render only that layer.

When selecting segments in the multi-layer timeline, the Storyboard view shows the same selection. See [Selecting Shots in the Storyboard](#) (page 328).

Top Vertical Priority

<\$nopage>Top Vertical Priority.<italic> See <Default Para Font>Multi-Layer TimelineWith exceptions, at any given point in a timeline with multiple layers, the top shot in a vertical stack of layers is the shot that is displayed, rendered, or played out to tape. This is the Top Vertical Priority rule and it is the default behaviour of the multi-layer timeline when Solo mode is disabled (See [Solo Mode](#) (page 309)).

When there is a gap in the top layer, this gap is transparent when looking down on the timeline; Lustre looks in progressively deeper layers (going from top to bottom in a vertical stack) until it finds the top vertical shot to display. To visualize this, it may help to imagine looking down on the multi-layer timeline so that you would have to see through the top layers in order to see the bottom layers. Your view from the top is a 'flattened' view of the timeline.

The only exception to the Top Vertical Priority rule is layer soloing (see [Solo Mode](#) (page 309)). There are a couple of features which alter the way the Top Vertical Priority rule works; layer muting (see [Muted Layers](#) (page 305)), and shot priority (see [Shot Priority](#) (page 305)).

The following example illustrates how top vertical priority determines which shots are displayed, played out to tape, and rendered. It also illustrates how the displayed shots come from various layers throughout the course of the timeline. For simplicity's sake, in this example, there are no muted layers and no shots assigned with shot priority.



(a) Shot 1 (L3) (b) Shot 2 (L2) (c) Shot 3 (L3) (d) Shot 4 (L2) (e) Shot 5 (L3)

You can use the timeline information field to verify the layer and shot being displayed at any given point in the timeline. See [Monitoring the Location of the Current Frame](#) (page 324). For example, in the following screen capture, the shot being displayed is shot 3 on Layer 2, and the current frame is frame 183.

Muted Layers

<\$nopage>muted layers.<italic> See <Default Para Font>Multi-Layer TimelineMulti-Layer Timeline:muted layersWhen a layer is muted, Lustre ignores this layer when applying Top Vertical Priority. That is, at a given point in the timeline, if a muted layer has Top Vertical Priority, Lustre looks at progressively lower layers in the vertical stack until it finds a shot in an unmuted layer, and then displays that shot.

WARNING If you are using the mute function as a method to create editorial or grade versioning, please keep in mind that the status is not part of the grade file data structure. Therefore, this state is not saved upon exiting Lustre.

The following example illustrates how a muted layer is used within a multi-layer timeline to determine what shots are displayed in the Storyboard and Player when the Top Vertical Priority rule is applied.



(a) Muted layer (b) Shot 1 (L3) (c) Shot 2 (L1) (d) Shot 3 (L3) (e) Shot 4 (L1) (f) Shot 5 (L3)

In this example, Layer 2 is muted. Therefore, only the shots in Layer 1 and Layer 3 are active.

To mute a layer:

- Do one of the following:
 - Ctrl-click the name of the layer you want to mute (e.g., V1.L1).
 - Shift+M to mute the layer with focus.

The layer name indicator turns yellow.

To unmute a layer:

- Do one of the following:
 - Ctrl-click the name of the layer you want to unmute (e.g., V1.L1).
 - Shift+M to unmute the layer with focus.

Shot Priority

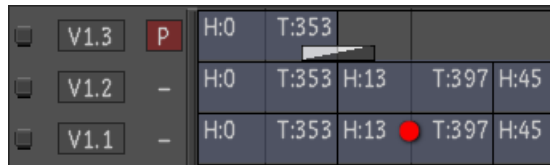
<\$nopage>shot priority.<italic> See <Default Para Font>Multi-Layer TimelineMulti-Layer Timeline:shot priorityWhen you work in the Top Vertical Priority mode (Solo is disabled), you can assign priority on a shot-by-shot basis. A 'priority shot' in a given layer is displayed even if there are shots in the layers above it in the timeline. In the case where there are multiple priority shots in a vertical stack, the priority shot with

Top Vertical Priority is displayed or updated accordingly in the Player. Furthermore, the Storyboard thumbnails are updated according to priority after an initial refresh. Lustre represents a priority shot in the multi-layer timeline as a shot with a red dot.

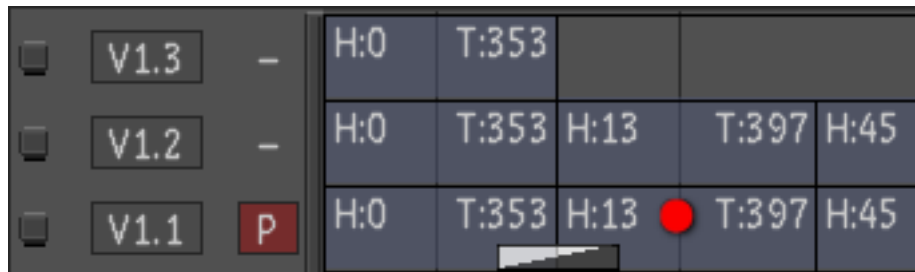
The following behaviours are expected when using the shot priority function:

- Shot priority information is saved to the cut file.
- A priority shot survives trimming, slipping, and sliding operations.
- When using the New button to create a new layer, the reproduced shot in the new layer preserves shot priority.
- When using the Copy button to copy a shot, the reproduced shot does not preserve shot priority.
- You can assign shot priority to a virtual black clip.
- You cannot assign shot priority to a gap.
- When performing a change cut operation with a cut that contains multiple versions of the same shot but with different grades, the shot priority feature allows you to designate the version of grading you would like to be transferred to the same shot in the new cut. However, if a muted layer has a priority shot, the grading metadata for this shot is not transferred to the new cut.
- In the case where a shot dissolves into another priority shot on a different layer within the vertical stack of shots, then the first shot does not dissolve seamlessly into the priority shot. For a seamless dissolve into a priority shot, you must create a dissolve on the layer of the priority shot.

In the following example, there is a dissolve on Layer 3 between shot 1 and shot 2. The dissolve begins near the end of shot 1, but once shot 2 on Layer 1 begins, the dissolve does not continue. Instead, shot 2 begins without showing the second half of the dissolve effect.



In the following example, the dissolve works as expected because the dissolve is on the same layer as the priority shot.



- When one priority shot overlaps another in a different layer, the priority shot with Top Vertical Priority is displayed. In overlap situations, this means that one or more shots are displayed that begin part way through or end part way through the shot.

In the following example, the first Layer 3 shot is displayed completely and then the Layer 2 shot is displayed starting somewhere in the middle of the shot.



WARNING If you mute a layer that has a priority shot, that shot is not displayed, played out to tape, nor rendered.

The following example illustrates shot priority in the multi-layer timeline.



(a) Muted layer (b) Shot 1 (L3) (c) Shot 2 (L1) (d) Shot 3 (L1) (e) Shot 4 (L1) (f) Shot 5 (L3)

In this example, Layer 2 is muted and Shot 3 in Layer 1 is a priority shot.

To assign shot priority to a shot:

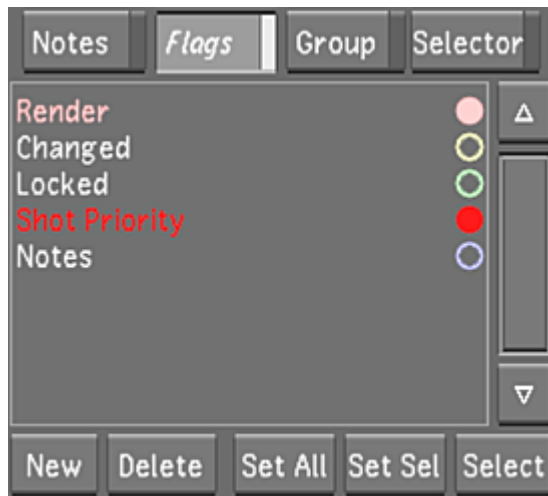
- 1 In the multi-layer timeline, **Shift+right-click** the shot (in the desired layer) to which you would like to assign priority.
A red dot appears on the shot.

To assign shot priority to the shot in focus:

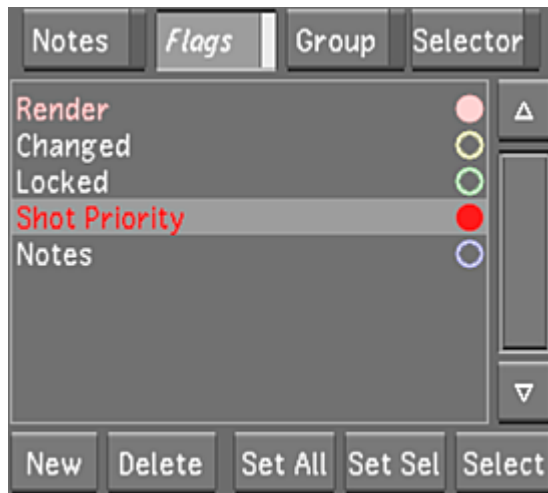
- 1 In the multi-layer timeline, make sure the positioner and its focus point are focused on the shot to which you apply priority.
- 2 Press **Shift+\.**
A red dot appears on the shot in focus.

To assign shot priority to several selected shots with the Shot Priority flag:

- 1 In the multi-layer timeline, select all the shots to which you wish to assign shot priority. See [Selecting Elements](#) (page 283).
- 2 **Shift+right-click** one of the selected shots to assign shot priority to that shot.
The Shot Priority flag is enabled.



- 3 In the Flags menu, left-click the Shot Priority flag.
The Shot Priority flag is highlighted.



NOTE The indicator is enabled only if the positioner and focus point is over a priority shot.

- 4 Click Set Sel.
All the selected shots are assigned shot priority.

To assign shot priority to the current shot of the currently active layer:

- 1 In the Timeline menu, enable the Flags button.
- 2 Right-click the Shot Priority flag.
A red dot appears on the current shot of the currently active layer.

To remove shot priority from a shot:

- 1 In the multi-layer timeline, **Shift**+right-click the shot with priority.
The red dot is removed from the shot.

To select all shots that are assigned shot priority:

- 1 In the Timeline menu, enable the Flags button.
- 2 In the Flags menu, left-click the Shot Priority flag.
The Shot Priority flag is highlighted.
- 3 Click Select.
All priority shots are selected.

Solo Mode

Multi-Layer Timeline:solo mode<\$nopage>Solo mode.<italic> See <Default Para Font>Multi-Layer TimelineWhen you enable Solo mode in the multi-layer timeline and place the focus point over a layer, Lustre displays only this layer (including its gaps) in the Storyboard and Player. In addition, this is the only layer that is played out to tape and rendered locally.

A soloed layer in Lustre overrides the effects of layer muting and shot priority (see [Muted Layers](#) (page 305) and [Shot Priority](#) (page 305)). That is, even when a layer is muted, if you subsequently solo this layer, this layer alone is displayed. Likewise, when there are shots with shot priority in several layers, a soloed layer is still the only layer displayed.

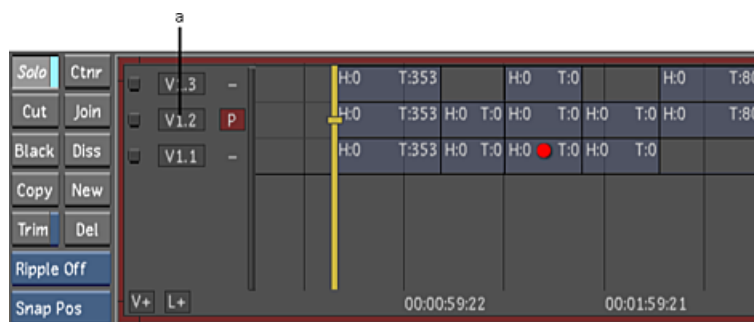
NOTE If you are using the solo function as a method to create editorial or grade versioning, please keep in mind that the status is not part of the grade file data structure. Therefore, this state is not saved upon exiting Lustre.

The following example illustrates how a soloed layer overrides other layer and shot prioritizing factors.

When Solo mode is enabled, the Storyboard is updated to display shots from only the soloed layer. When Solo mode is disabled, what Lustre displays is governed by what layers are muted, the presence of shots assigned with priority, and typical Top Vertical Priority behaviour.

In the following example, Layer 2 is soloed. In this case, only Layer 2 is displayed in the Player and Storyboard, played out to tape, and rendered. It should be noted that although there is a shot assigned with shot priority in Layer 1, only Layer 2 shots are displayed because Solo mode takes priority.

WARNING If a layer is soloed, the Edit tools (Trash, Delete, Trim In/Trim Out, and Mark In/Out) default to 'Ripple End' behaviour, regardless of the Ripple Mode setting. If no layer is soloed, however, the Edit tools behave according to the individual Ripple Mode selected (Ripple Off, Ripple Start, or Ripple End) and apply to the active or visible layer that contains the focus point. For more information about Ripple Modes, see [Trimming With Ripple Mode](#) (page 298).



(a) Soloed layer

To solo a layer:

- 1 Move the focus point of the positioner to the layer you wish to solo.
- 2 Enable the Solo button.

To un-solo a layer:

- 1 Disable the Solo button.

NOTE This operation un-solos the layer regardless of where the focus point is.

Rendering the Timeline

Timeline:renderingrendering:TimelineThere are numerous scenarios when you render a timeline. See [Rendering](#) (page 591).

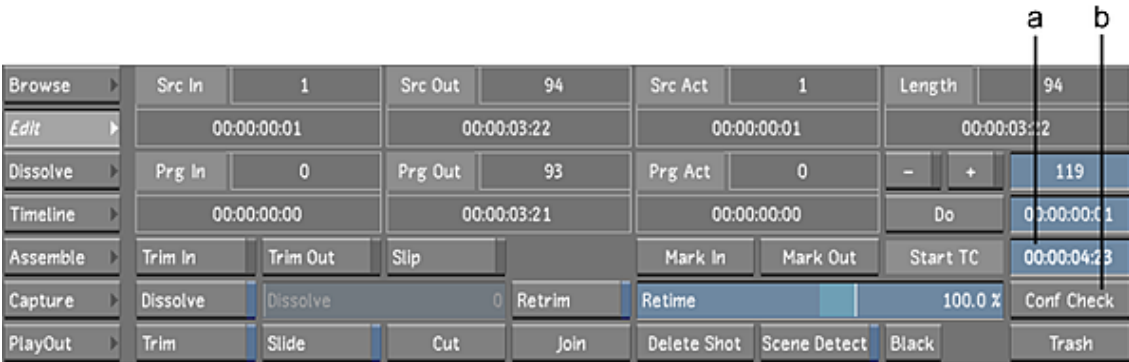
Modifying the Timeline's Starting Record Timecode

Timeline:modifying the starting timecodeediting:start timecodetimecode:modifying the start valueYou can change the timeline's start timecode by entering either a start timecode or the number of frames you want to start from. Modifying the start timecode does not delete frames that precede the new start frame.

To modify a shot's starting timecode:

- 1 Click Editing in the main menu, and then click Edit to display the Edit menu.
- 2 Do one of the following:
 - To enter a timecode, click in the Start TC field and use the numeric keypad to enter the timecode at which you would like the timeline to begin. This value is converted into the corresponding frame number (as shown in the frame field).
 - To enter a frame number, click the Start TC field, then click the frame field and use the numeric keypad to enter the frame number at which you would like the timeline to begin. The frame number is converted into the corresponding timecode value.

NOTE Ctrl-click either the frame or Start TC field to clear it.



(a) Frame field (b) Start TC field

- 3 Press Enter on the numeric keypad.

Performing a Confidence Check

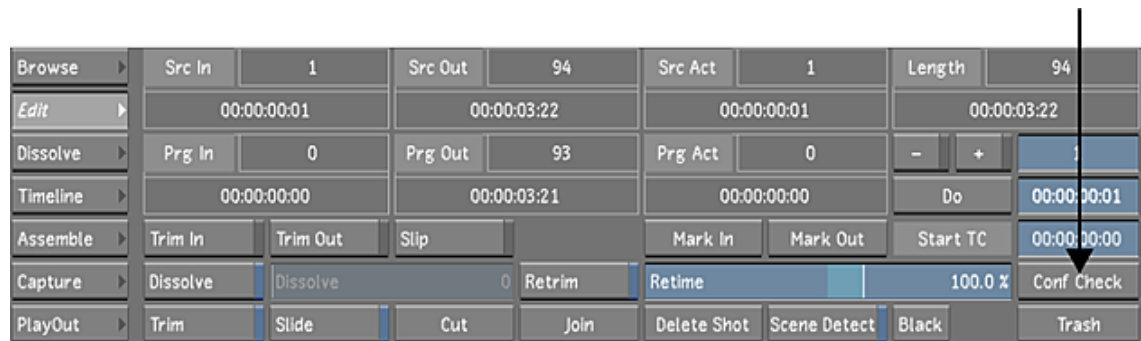
Timeline:checking against an offline cutconfidence check, performingA confidence check is a process in which you manually check the contents of your timeline (which you created by assembling shots from the scanned film frames) against a digital reference cut captured directly from an offline edit video tape or other

medium. This is an important step in ensuring that the assembled timeline contains the frames specified by the offline editor. If, for any reason, there is an offset between your current timeline and the digital cut, your picture could end up out of sync with the sound.

NOTE The confidence checking function allows you to synchronize the start frames of the timeline and digital reference cuts and does not involve a synchronization of timecodes.

To perform a confidence check:

- 1 Load or create the timeline by doing one of the following:
 - Loading a current timeline. See [Importing Timelines as Source Clips](#) (page 282).
 - Creating a newly assembled timeline from an EDL. See [Working with EDL, ALE, and Cutlist Files](#) (page 233).
- 2 Save the current cut, create a new cut, and load it.
- 3 Capture the footage you want to use as a point of comparison (this is the offline digital cut). See [Capturing Material](#) (page 646).
- 4 Click Editing, and then click Edit to display the Edit menu.
- 5 Drag the digital reference cut from the Library to the Confidence Check button.



A split screen display appears. The current first frame is loaded in the left viewer and the digital cut is loaded in the right viewer with the first frame displayed.

- 6 Navigate between shots to make sure each timeline shot starts on the exact same frame as in the reference cut. You must check the two versions by eye in search of discrepancies. If, for any shot, you determine the two start frames (timeline and reference) do not start on the same frame, synchronize the start frames.

Synchronize the reference cut to the timeline by offsetting the reference cut in the right viewer:

- Left-click the reference image (right-side image) and drag left to scrub in reverse.
- Left-click the reference image and drag right to scrub forward.
- Middle-click the reference image to go one frame forward.
- Right-click the reference image to go one frame backward.

- 7 Navigate within each shot by stepping through the cut points frame-by-frame to make sure there are no shots that are offset.

If you determine there are shots that are offset, you can use the Editing tools (trim, slip, and slide) to adjust the shots to the correct frames. This is usually performed in the timeline cut and not the reference cut.

To trim from the Edit menu, see [Trimming from the Edit Menu](#) (page 262).

To trim from the Timeline menu, see [Trimming Elements](#) (page 298).

It is important to note that when matching your timeline to a reference clip, several editing changes are automatically updated in the Player without the need to release the mouse button:

- trimming
- slipping
- sliding

8 Save the current cut.

The confidence check reference is saved with the cut. When using a clip from the Library for a Confidence Check, the reference clip, its timing offset and the viewing mode (Single or Dual and Wipe position) are saved with the cut information. When reloading a cut, you do not need to manually reload the Confidence Check clip and set the proper offset value. Simply clicking the Conf Check button (located in the Editing/Edit menu) displays the confidence check view with the reference clip and the defined offset value.

NOTE Only source clips can be used as a Confidence Check reference. Sequences are not supported.

Using Scene Detection

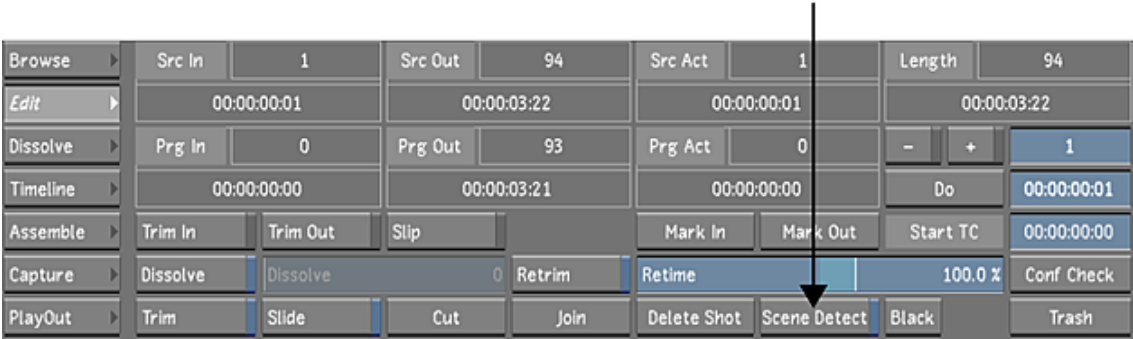
shots:dividing into scenesscenes:detectingUse scene detection when you are working on a single shot made up of multiple scenes. Scene detection locates the frames when scenes change and splices the shot at those points. When you apply scene detection to a shot in the Storyboard, it is broken up into numerous smaller pieces that you can then colour grade independently.

For example, you may have a finished edited HD master tape that needs to be colour graded before it is ready for broadcasting. You can capture the entire tape as one shot, and then use scene detection to cut it into separate shots. You can then colour grade each shot one-by-one.

NOTE Lustre uses the scene's Src In number to assign unique ID numbers during scene detection. This ensures that any scene captured more than once has the same number assigned to it, which is useful when scenes are transferred from Lustre to other effects applications, and back again. By using the Src In number as the basis for assigning numbers, the grading metadata applied to a scene that has been captured and put through scene detection more than once, is maintained.

To use scene detection:

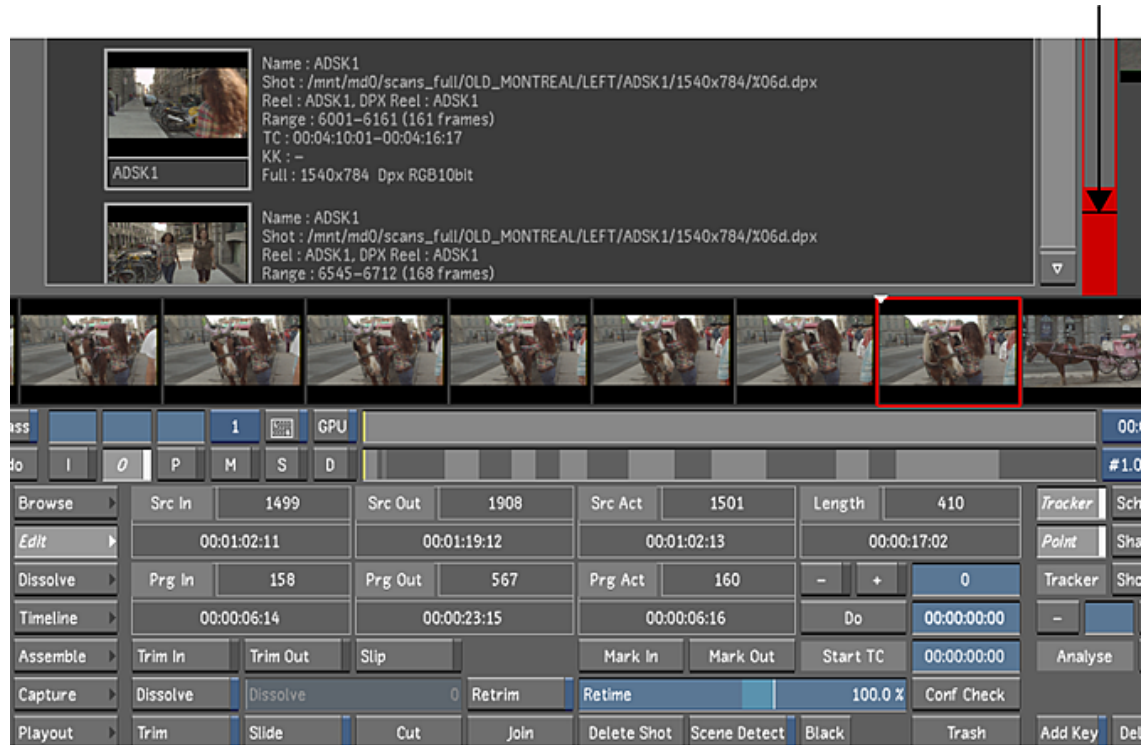
- 1 Capture from an edited video tape. See [Capturing Material](#) (page 646).
- 2 Create a new empty cut. See [Managing Cuts](#) (page 101).
- 3 Drag the digitized shot from the Library to the Storyboard.
- 4 Click Editing, and then click Edit to display the Edit menu.
- 5 Enable Scene Detect.



TIP If the Editing While Grading button is enabled in the User settings, you can start a scene detection from any menu by pressing **Shift+S**. For more information about the Editing While Grading button, see [System & Menu Settings](#) (page 88).

A threshold indicator bar appears to the right of the Library. When a scene change is detected, the indicator jumps and turns red, and a splice is introduced into the Storyboard, Timeline, and timebar at that frame. When the process is completed, a series of shots is created in the Storyboard.

- 6 You can change the threshold by dragging the thin black horizontal line in the threshold indicator up or down. When you lower the threshold value, a small amount of change is enough to trigger a splice. If the value is too low, splices appear in the middle of a scene. If the value is too high, some changes may not be detected. Generally, the default threshold value gives a good result.



- 7 Press **Spacebar** to pause the scene detection process.

NOTE To continue a paused scene detection, press **Spacebar** again. To stop scene detection, hold down your left mouse button.

- 8 If, for any reason, a scene change is not detected, you can add a cut manually by clicking **Cut**. See [Inserting Cuts](#) (page 269).

Playing, Viewing, and Sorting Shots

13

Lustre offers multiple options for playing, viewing, and sorting shots during the creative process. Use the Player to play one or more shots with your choice of view options, such as proxy resolution with the red colour channel displayed. Move through shots on the timeline using one of several navigation methods. Sort the shots in the timeline so grading can be completed with more ease. Use a reference shot to facilitate tasks such as colour matching. View the reference shot in a separate window or in split-screen with the current shot. If the addition of multiple effects are slowing down playback time, you can cache frames to bring the playback speed closer to real-time.

Playing Shots

playing:shots in the Playershots:playing in the PlayerYou can play shots in the Player from any menu in Lustre using either playback controls or hotkeys. To play shots, you must first load them into the Storyboard. See [Creating a Cut with Shots in the Library](#) (page 214).

You can also use a full-screen Player to view shots without the clutter of menus. This Player is particularly useful for viewing 2K footage at full resolution.

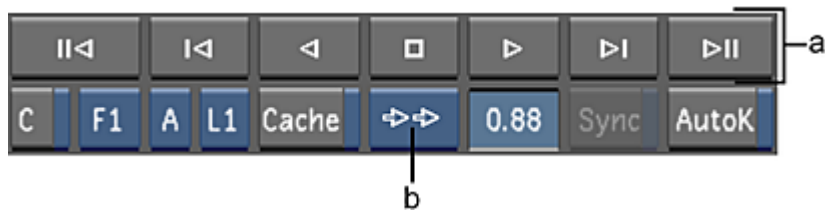
When you play shots in the Player, you can do the following:

- Loop the entire Storyboard.
- Loop the current shot in the Storyboard.
- Loop between in and out points.

NOTE For information on playing shots with audio, see [Using Audio](#) (page 176).

To play shots in a cut:

- 1 Load your shots into the timeline. See [Adding Shots to the Timeline](#) (page 282).
- 2 Click the Play Mode button to cycle through playback range options.



(a) Playback controls (b) Play Mode button

Select:	To specify a looped playback range:
	Of the entire timeline.
	Of the current shot.
	Between in and out points.

- 3 To set in and out points, go to the start and end frame and mark the in and out points.

Press:	To:
Shift+I	Mark an in point.
Shift+O	Mark an out point.
Shift+L	Clear in and out points.

- 4 Use the following playback controls or hotkeys to play your shot forward or backward.

Click:	Or press:	To:
	Right Ctrl during playback	Play the cut forward.
	Right Alt during playback	Play the cut backward.
Alt + 	N/A	Low Latency playback mode (without audio), which removes the delay between DVI and SDI (AJA SDI Preview only).
	N/A	Stop playback.
N/A	Spacebar	Start or stop playback in the direction last played.

When playback is stopped, the Right Alt and Right Ctrl keyboard shortcuts are used for backward and forward frame navigation, as in previous releases.

NOTE For information on navigating to a particular frame, see [Navigating through Shots](#) (page 322).

It is also possible to set the playback speed, using the Up and Down arrow keys. Lustre plays back from 1x up and no lower than realtime speed.

- Press the **Up arrow** during playback to double the playback speed.
- Press the **Down arrow** during playback to reduce the playback speed by half.
- Press **Space Bar** to start / stop playback. This does not reset the playback speed to 1x.
- Press the Play Forward or Play Backwards buttons in the user interface to reset the playback speed to 1x.

Using the Full-Screen Player

Player:activating full-screenfull-screen Player:activatingThe full-screen Player allocates the entire screen to the image. Use it when you want to maximize screen space for viewing shots, for example, while colour grading.

There are no playback controls available in the full-screen Player. Instead, you use hotkeys and mouse gestures to play shots, access both playheads, display two or more shots at the same time, and pan and zoom the image. You can also display the Storyboard, vectorscope, histogram, and waveform monitor. See [Viewing Colour Distribution](#) (page 405).

NOTE The histogram, vectorscope, and waveform monitors do not dynamically update when GPU is enabled. They retain the colour distribution of the image prior to GPU being enabled.

The full-screen Player is available from all menus except the Editing menus.

To use the full-screen Player:

- 1 From any menu in Lustre except the Editing menus, press `Enter`.
The full-screen Player appears.
- 2 Use hotkeys or mouse gestures to play the shot, zoom in or out, pan the image, change the view, or switch playheads. You can also display the Storyboard, vectorscope, histogram, and waveform monitor. See [Player Hotkeys](#) (page 345) for a list of the hotkeys and mouse gestures commonly used in the full-screen Player.
- 3 To exit the full-screen Player, press `Enter` again.

Viewing Reference Images

reference images:viewingThe Player has two playheads, A and B, which allow you to quickly access two different areas of your cut. Lustre keeps track of the location of the current frame on each playhead as you navigate through the cut, so you can instantly return to that location by switching playheads.

You can use the playheads to view reference images while you work. Reference images are useful when you want to create continuity grades, apply input LUTs, or create effects with Sparks. You can also switch between the current shot and a reference shot if you do not need to view them simultaneously.

It is recommended that you work on your shot in Playhead A and load the reference images into Playhead B. For example, in Playhead B, you can view a reference image from the shot adjacent to the one you are currently working on in Playhead A. Visually compare the two images to match the saturation, whites and

blacks, and the colours of the shot you are working on to the image in the reference buffer. The Playhead button indicates which playhead is active.

TIP After you have assigned shots to the playheads, you can view them together in Dual View. See [Using Dual View](#) (page 334).

To view a reference image loaded from a cut:

- 1 Press F1 or select A from the Playhead button and then select the shot in the Storyboard.



The shot you are working on is assigned to Playhead A.

- 2 In the Storyboard, go to the frame you want to use for the reference image.
- 3 Press K to store the frame in the reference buffer.
The current frame overwrites the last frame loaded into the reference buffer.
- 4 Press F2 or select B from the Playhead button.
The shot is assigned to Playhead B.
- 5 Press L or click the S button to display the reference image in Playhead B.



The reference image appears in the Player.

TIP At any time, press L to toggle between the original shot (O button) and the reference image (S button).

The current shot on each playhead is indicated by the border colour in the Storyboard.

Border colour:	Indicates the current shot on:
Bright red	Playhead A (active).
Bright purple	Playhead B (active).
Dimmed red	Playhead A (inactive).
Dimmed purple	Playhead B (inactive).

- 6 To work on the shot you assigned to Playhead A, press F1 or select A from the Playhead button.
The shot you are working on is selected. You can move back and forth between the shots in Playhead A and Playhead B by pressing F1 and F2, respectively.

To view a reference image loaded from a Grade bin:

- 1 Press **F1** or select **A** from the Playhead button and then select the shot in the Storyboard.
The shot you are working on is assigned to Playhead A.
- 2 In the Grade bin, right-click the frame you want to use for the reference image.
The frame from the Grade bin overwrites the last frame you loaded into the frame buffer.
- 3 Press **F2** or select **B** from the Playhead button.
The shot is assigned to Playhead B.
- 4 Press **L** or click the **S** button to display the reference image in Playhead B.
The reference image appears in the Player.

TIP At any time, press **L** to toggle between the original shot (**O** button) and the reference image (**S** button).
- 5 To work on the shot you assigned to Playhead A, press **F1** or select **A** from the Playhead button.
The shot you are working on is selected. You can move back and forth between the shots in Playhead A and Playhead B by pressing **F1** and **F2**, respectively.

To switch between a reference image and the shot you are working on:

- 1 Load the reference image to the frame buffer. Do one of the following:
 - Press **K** to load the current frame in the Storyboard to the frame buffer.
 - Right-click a Grade bin thumbnail.
- 2 In the Storyboard, select the shot you are working on.
The shot appears in the Player.
- 3 To toggle between the reference image and the shot you are working on, press **L**.

Panning and Zooming the Image

full-screen Player:panning and zooming
zooming:in Player and full-screen Player
panning:in Player and full-screen Player
You can pan and zoom the image from any menu in Lustre except the Editing menus. You can pan and zoom in both the Player and the full-screen Player.

To pan the image:

- 1 Place the cursor over the image, press and hold the middle mouse button, and drag in the direction you want to pan.

To zoom the image:

- 1 Do one of the following:
 - Place the cursor over the image, press and hold the middle and right mouse buttons, and drag right to zoom in or left to zoom out.
 - Press and hold the mouse button in the Zoom field and drag right to zoom in or left to zoom out. Click once in the field to reset it to 1.00 (Player only).
 - Right-click in the Zoom field to display the calculator, and then use it to enter a zoom value.



TIP Zooming normally occurs in increments of 0.1. However, to quickly jump between a zoom factor of 1.00 and 2.00, press F10.

Setting Image View Options

- view modes:setting Lustre has several view options. As you work on a grade, you can:
- Display various versions of the image (for example, before or after secondary colour grading).
 - Toggle between full resolution and proxy resolution.
 - Display a specific channel of the image.
 - Switch between fields when working with interlaced footage.
 - Switch between viewing LUTs.

Setting the View Mode

reference, setting the view modesecondary colour grading:view modeprint, view modeoutput, view modecurves colour grading:view modeprimary colour grading:view modeview modes:settingUse the View Mode buttons to view different versions of the image as you work on your grade.

To set the view mode:

- 1 Click one of the View Mode buttons.



Click:	Or press:	To view:
I	I	The image with colour corrections made in the Grading and Curves menus only. NOTE You cannot select this mode if no corrections have been made in the Secondaries menu.
O	O	The output image, which contains the result of all corrections applied. This is the default viewing mode.

Click:	Or press:	To view:
P	P	The printed, or rendered image. See Rendering (page 591). If the frame has not been rendered, a red X appears in the image window. NOTE If you rendered a shot and still see a red X in the image window, press Shift+P to force Lustre to re-detect all rendered files.
M	F11	The matte on a secondary correction. Press F11 to toggle between Secondary (Overlay) and Matte (Greyscale) view modes for the matte. See Creating a Secondary by Keying a Range of Colours (page 477).
S	L	The stored reference image. See Viewing Reference Images (page 317).

The image changes to the selected view mode.

Selecting the Resolution

full-resolution images, displayingproxies:displayingresolution:displayWhile working, you can display the full-resolution version of shots or half-resolution proxies in both the Player and full-screen Player. Displaying proxies speeds up interaction and playback on shots with many effects added to them. Half-resolution proxies are also useful for playing to projectors and for saving disk space—they take up only 1/4 of the space of the original footage. For example, you can store proxies on the server and full-resolution footage on the main storage device.

You can switch between full and half resolution any time. Generating and displaying proxies does not affect your original footage in any way. The resolution is independent of the grade file data.

To display proxies, you must first generate them. See [Generating and Viewing Proxies](#) (page 603).

To set the resolution:

- 1 In any menu, click the Full/Half Resolution button.



The resolution toggles between full and half (proxy) resolution. An ungenerated proxy appears as a red X with a black background.

NOTE Buttons for switching between full and half resolution are also found in the Grade and Render menus.

Setting the Active Field for Display in the Player

field-based processing, setting the active fieldinterlaced video, setting the active fieldInterlaced video formats divide frames into two line-based fields. One field consists of the first and subsequent odd lines in the frame, and the other field consists of the second and subsequent even lines in the frame. During the recording

process, the images that make up each field are recorded at slightly different moments. For example, when recording NTSC, field 1 is recorded 1/60th of a second before field 2.

While in Output view mode, Lustre can only display one field at a time. The field that is displayed is the active field. When you render the footage, both fields are processed.

NOTE Setting the active field affects preview display only and does not impact the final output. Rendering is performed according to field dominance grade settings selected during project creation.

To set the active field:

- 1 Toggle the F1/F2 button.

NOTE You need to select Interlaced in the Setup > Grade menu in order to enable this button.

This switches the view in the Player between field 1 and field 2.



Setting the Viewing LUT

LUTs: viewing viewing LUTs: selecting Use the LUT button to display the image using one of three Print LUTs selected for viewing purposes. See [Defining Print LUTs for Viewing](#) (page 188).

To cycle between LUTs:

- 1 Click the LUT button one or more times.



The button label changes to L1, L2 or L3, indicating the currently loaded LUT.

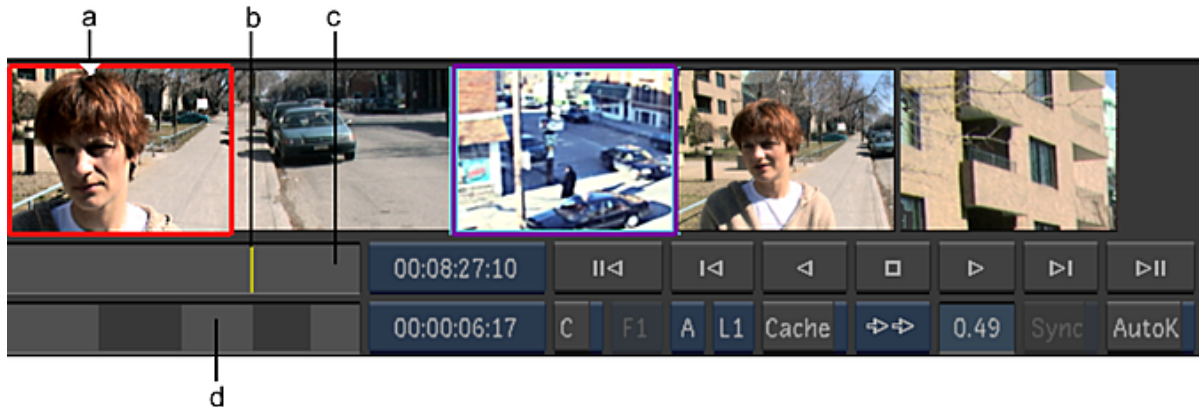
Navigating through Shots

Storyboard: navigating navigating: the Storyboard Various methods are available for navigating through the shots in your cut. You can navigate using:

- Storyboard and the shot and scene timebars.
- Playback controls and hotkeys.
- Timecode field.
- Timecode calculator.

Navigating Using the Timebar and Storyboard

Storyboard:navigating using Timebar and Storyboard
navigating:using the timebar and Storyboard
Lustre has two timebars to help you navigate through your cut. The Shot timebar represents the current shot, and the Scene timebar represents all the shots in the cut. Use either timebar to move to another frame.



(a) Storyboard position arrow (b) Shot positioner (c) Shot timebar (d) Scene timebar

In the Scene timebar, shots are represented by grey bars in alternating shades of grey, which makes them more visible. The length of each bar is proportional to the length of the shot. Each timebar has a positioner that indicates the location of the current frame. In the Storyboard, the position arrow also indicates the position of the current frame.

To move to a new location in the cut:

- 1 Click either the Scene or Shot timebar.
The positioner moves to the frame corresponding to the location you clicked.

To scrub through one or more shots:

- 1 Drag the positioner of either timebar to the left or right.

When working on long shots with animation, it can be hard to see the location of various keyframes in the Shot timebar. You can now set a zoom factor for every shot in the Shot timebar:

To zoom the Shot timebar

- Right-click the Shot timebar and drag left or right to zoom in or out on the Shot timebar. When zoomed in, start, current and end frame indicators appear to queue you as to where you are at in the shot. And frame indicators appear when the zoom factor is set to display 10 frames or less.
- Press **Ctrl+Left Click** to reset the zoom value.
- Middle-click the Shot timebar and drag left or right to pan the Shot Time Bar.

To pan the Storyboard:

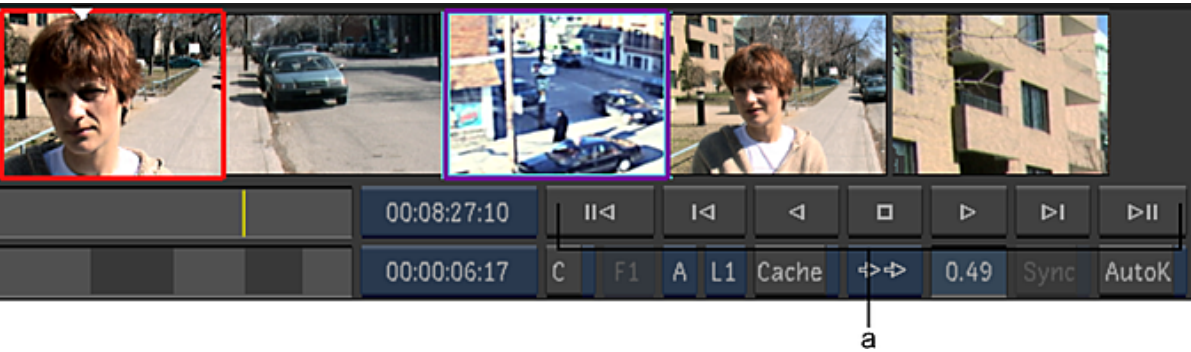
- 1 Place the cursor over any thumbnail, press the middle mouse button, and drag to the left or right.

To go to the first frame in a shot:

- 1 Click the shot thumbnail in the Storyboard.

Navigating with the Playback Controls and Hotkeys

hot keys:navigating with the playback controlsnavigating:with playback controls and hot keysYou can use playback controls to navigate through shots. There are hotkey equivalents for several of these controls.

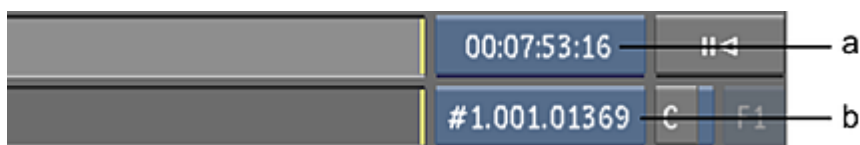


(a) Playback controls

Playback Control	Hotkey	Description
	N/A	Goes to the first frame in the cut. To step one frame back, right-click the button.
	Left Arrow	Goes to the first frame in the shot. Click or press repeatedly to move backward from shot to shot.
	Down Arrow	Plays the cut backward.
	Spacebar	Stops playback.
	Up Arrow	Plays the cut forward.
	Right Arrow	The playback control goes to the last frame in the shot. The hotkey goes to the first frame in the next shot. Click or press repeatedly to move forward from shot to shot.
	N/A	Goes to the last frame in the cut. To step one frame forward, right-click the button.

Monitoring the Location of the Current Frame

monitoring location of current frameThe Source Timecode field indicates the source timecode for the current frame. The timeline information field indicates the location of the current frame, as well as other information pertaining to the shot.



(a) Source Timecode field (b) Timeline Information field

You can click the timeline information field one or more times to display other information, as described in the following table.

Information:	Indicates:
283	Frame number of the current frame.
0 Frame/Sec	Frame rate (when playing shots).
00:00:11:18	Timecode of the current frame.
000017+10	Frame number in film feet/frames.
#1.004.00001	Layer, Shot, and Frame numbers of current frame in the following format: #LL.SS.FF (LL-Layer, SS-Shot, FF-Frame)

Navigating With the Timecode / Frame Counter Calculator

timecode:calculatingcalculator:using to calculate timecodeThe timecode / frame counter calculator is displayed when you right-click in the timecode or the frame counter field.

You can use the timecode / frame counter calculator to do the following:

- Jump to a specific frame on the Storyboard.
- Calculate timecodes from frame count and vice versa.
- Switch between drop frame and non-drop frame timecodes (NTSC only).
- Convert drop frame timecodes to non-drop frame timecodes and vice versa.

The timecode calculator operates much like the standard Lustre calculator, but with some differences.

Click:	To:
The calculator's numeric field	Jump to the frame number that corresponds with the value entered in the calculator's numeric field.
Add	Jump ahead the number of frames entered in the calculator's numeric field.
Sub	Jump back the number of frames entered in the calculator's numeric field.

Click:	To:
. (period)	Insert two zeroes in the calculator's numeric field.
TC/FRM	Switch between the timecode and frame number. This button indicates the current state. TC indicates timecode, and FRM indicates frame.
DF/NDF	Switch between drop frame and non-drop frame timecodes. This button indicates the current state. DF indicates Drop Frame mode. NDF indicates Non-Drop Frame mode. This button is only enabled if 30 or DF is set as the project frame rate in the Setup Project menu.

NOTE If you enter a timecode or frame number that exceeds the shot or Storyboard limit, nothing will happen.

To calculate timecodes from frame counts:

- 1 Click the timeline information field until the frame number is displayed.
- 2 Right-click the timeline information field to display the timecode calculator.
- 3 Using the timecode calculator's numeric keypad, enter a frame number.
- 4 Click FRM. The corresponding timecode is displayed.

Storyboard Viewing Options

Storyboard:navigatingThe Storyboard is a thumbnail representation of your timeline. Each individual thumbnail represents a single shot. The Storyboard has multiple viewing options. You can:

- Show or hide the Storyboard.
- Display the Storyboard in regular or large view.
- Select one or more shots.
- Identify selected shots by means of their selection colours.
- Refresh Storyboard thumbnails.
- Collapse the Storyboard thumbnails.
- Automatically update the Storyboard thumbnails.
- Display system or user-defined flags on the Storyboard and on the On-Screen Display:
 - You can create up to 128 user-defined flags, but a maximum of 40 user-defined flags can be displayed in Storyboard display. The number of flags that can be displayed in On-Screen Display varies based on flag size and the resolution of the content.
 - When loading a grade, the flags saved in this grade can be integrated to the application-based custom flags file. This is enabled using the Keep Flags From Grades User Preference.
 - When the Keep Flags From Grade option is disabled, you can still save flags from your grades, when modifying the grades (position, name or color). The flags are saved when you save the grade.

Showing and Hiding the Storyboard

hiding, StoryboardStoryboard:showing and hidingYou can hide the Storyboard to increase the space available for the image you are working on. You can do this from all menus except the Editing menus — the Storyboard is always visible from the Editing menus.

To show or hide the Storyboard:

- 1 Press **Tab**.

Setting the Storyboard View

size, setting the Storyboard viewStoryboard:setting view sizeYou can display the Storyboard in regular or large Storyboard view. In regular Storyboard view, it appears below the image window. In large Storyboard view, it appears to the left of the browser, where the Library is usually displayed. Large Storyboard view displays more shots at once in the Storyboard.

You can do all operations, such as selecting or deleting shots, from either Storyboard view. You can display the large Storyboard view from all menus except the Editing menus, in which case, the Library always appears to the left of the browser.

To toggle between regular and large Storyboard view, press **Q**.

In Large Storyboard view, you can now define the size of thumbnails using the **Alt+Q** keyboard shortcut. This cycles between normal and double sized thumbnails.

If you have a DVI monitor connected to your system, you can use the full width of the DVI monitor to display the Large Storyboard view, using the **Ctrl+Q** keyboard shortcut.

Updating the Storyboard Thumbnails

updating Storyboard thumbnails;thumbnails:updating in Storyboard;storyboard:updating thumbnailsAs you are making changes to the shots within your timeline, you may want to automatically see the changes within the Storyboard thumbnail. The update Storyboard option allows this to happen.

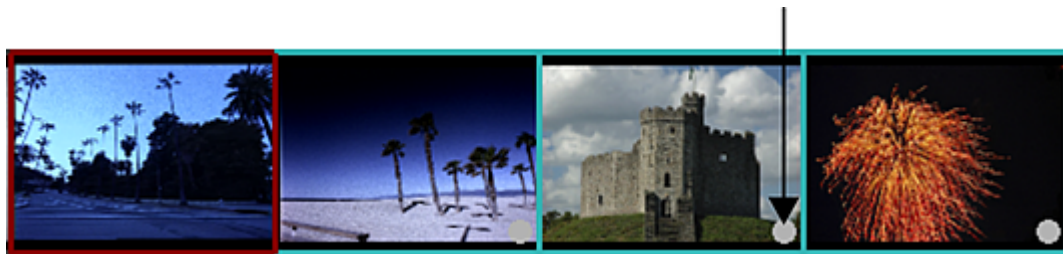
To enable or disable the automatic Storyboard thumbnail update option:

- 1 Do one of the following:
 - Within the Setup > Interface menu, click the Update Storyboard button.



- Press **Shift+1**.
- Within the Display & Interface menu of the user configuration settings, click Update Storyboard. See [Display & Interface Settings](#) (page 85). Refer to “Display & Interface Settings” in the “Project Management” chapter in the Lustre User Guide.

If the Update Storyboard feature is enabled and you make changes to any shot that is not currently in the Player, a grey dot will appear on the bottom-right corner of the thumbnail. The grey dot signifies that a change has been made to that shot, but the thumbnail has not been automatically updated.



When you apply changes to a group of shots, only the thumbnail of the current shot within the Player is automatically updated. To update the other thumbnails, click the Storyboard thumbnail with the grey dot.

Selecting Shots in the Storyboard

shots:selecting in the StoryboardStoryboard:selecting shotsYou can select a single shot or multiple shots in the Storyboard. Multi-select shots to copy parameters, delete multiple shots, and create groups.

When selecting Storyboard thumbnails, the multi-layer timeline shows the same selection. Likewise, when selecting multi-layer timeline segments, the Storyboard shows the same selection. It should be noted that:

- The Storyboard view shows segments as being selected provided these segments are the topmost shot or have shot priority.
- The Storyboard view shows all segments in the multi-layer timeline if Solo mode is enabled.

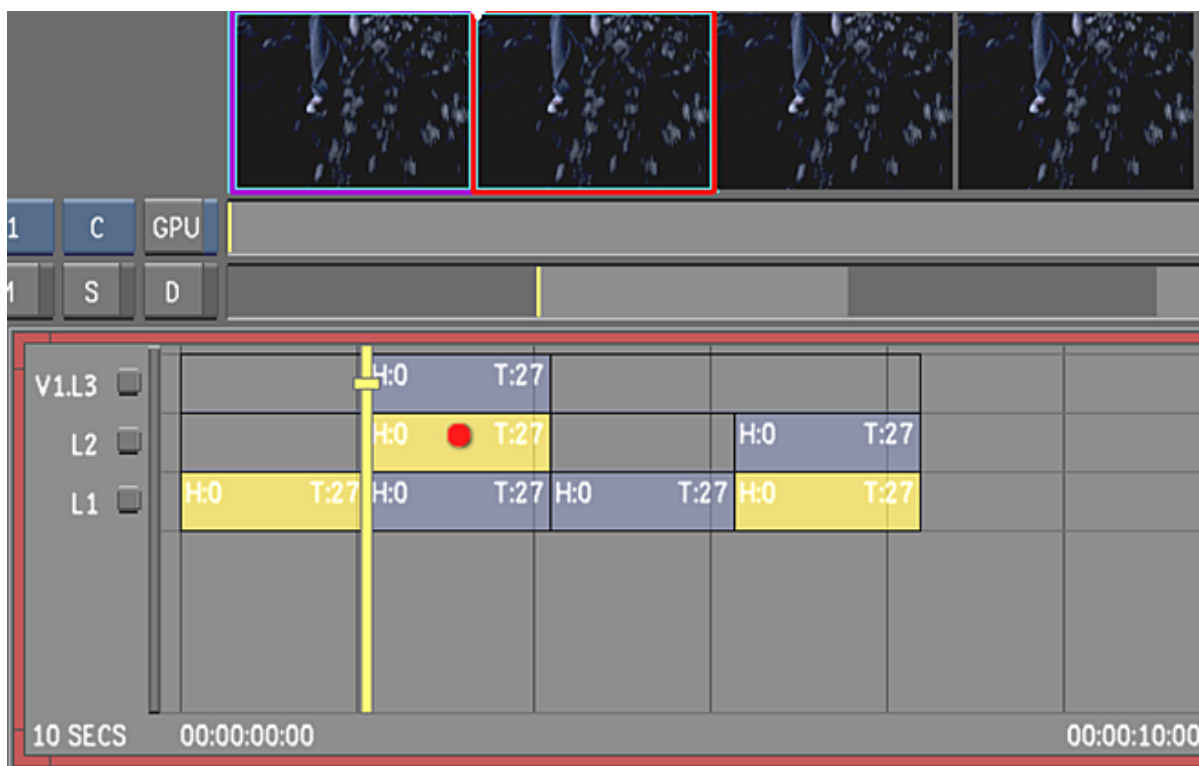


Image courtesy of Moviworld / UK File & TV Company / Videolab

In the above example, all the selected shots in the multi-layer timeline are displayed and selected in the Storyboard view except for the far-right Layer 1 shot. The Layer 1 shot on the far right is neither displayed nor selected in the Storyboard. For more information about top vertical priority and shot priority, see [Top Vertical Priority](#) (page 304).

To select a single shot:

- 1 Click the thumbnail.
The border changes to red, indicating it is the current shot.

To select multiple shots:

- 1 Click the first shot you want to select.
The border changes to red, indicating it is the current shot.
- 2 Right-click the subsequent shots you want to select.
The border of each subsequent selected shot changes to aqua.

To select a range of shots:

- 1 Right-click the first shot you want to select and drag across the range of shots while holding down the mouse button.

To deselect multiple selected shots:

- 1 Right-click the selected shots.

Storyboard Selection Colours

shots:identifying selection colours on the StoryboardStoryboard:selection coloursAs you work with shots in the Storyboard, the border colours indicate the selection state, as described in the following table.

Colour:	Indicates:
Red	The current shot on Playhead A.
Pink	The source shot picked up in the Library for a Shot Replace operation.
Aqua	Multiple selected shots (except for the current shot).
Yellow	Shots included in a group (in Gang mode).
Purple	The current shot on Playhead B.
Orange	A target shot in a Shot Replace operation.
Blue	A shot picked up from the Library.
Green	A shot picked up from the file browser.

Refreshing Storyboard Thumbnails

thumbnails:refreshing in the StoryboardStoryboard:refreshing thumbnails;refreshing thumbnailsAs you work on your material, you must refresh the Storyboard thumbnails so that they will reflect the changes made to the image. You can refresh them anytime. You can refresh the current shot, or refresh multiple thumbnails at once.

To refresh a single Storyboard thumbnail:

- 1 Select the thumbnail you want to refresh. You can be on Playhead A or B.
The thumbnail border turns red if you are on Playhead A, or purple if you are on Playhead B.
- 2 Press . (period).

To update multiple Storyboard thumbnails simultaneously:

- 1 Press Shift+. (period).
The thumbnails from the current shot onwards are updated.
- 2 To stop the update process, click any mouse button.

Displaying Only Selected Shots in the Storyboard

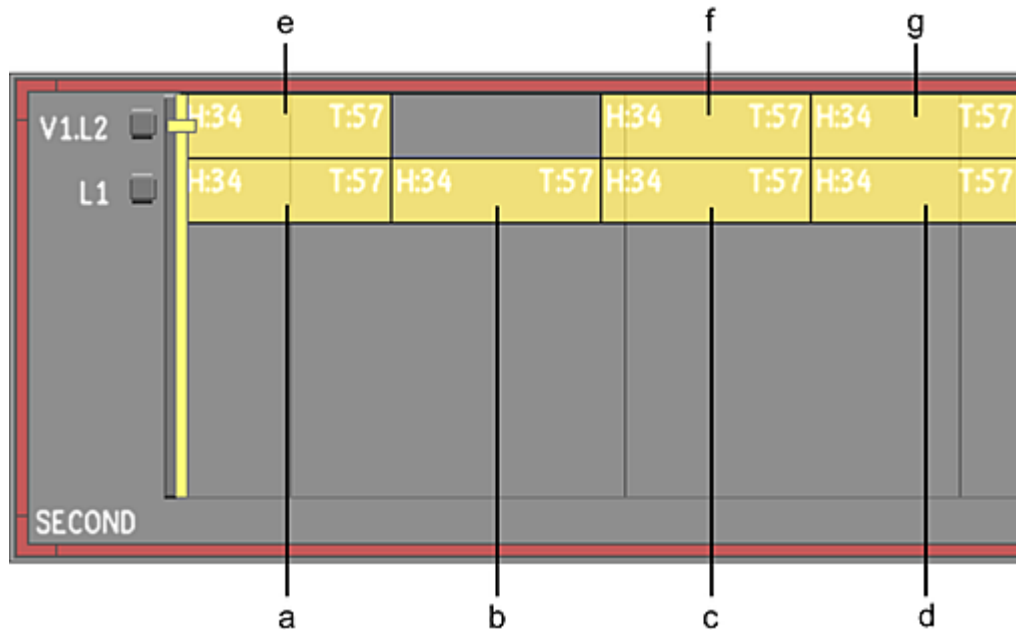
collapsing, StoryboardStoryboard:collapsingIn the multi-layer timeline you can select shots on multiple layers and collapse the Storyboard so that only selected shots are visible. This is useful to isolate certain types of shots for grading, such as outdoor scenes. In addition, in the multi-layer timeline, you can select all the shots on all layers and use the collapse function to align all layers sequentially in the Storyboard.

NOTE Another way to present a multi-layer timeline selection in the Storyboard for grading purposes is to select either A-Mode or C-Mode for sorting the timeline. For more information about the Timeline Sort feature, see [Timeline Sort Mode](#) (page 338).

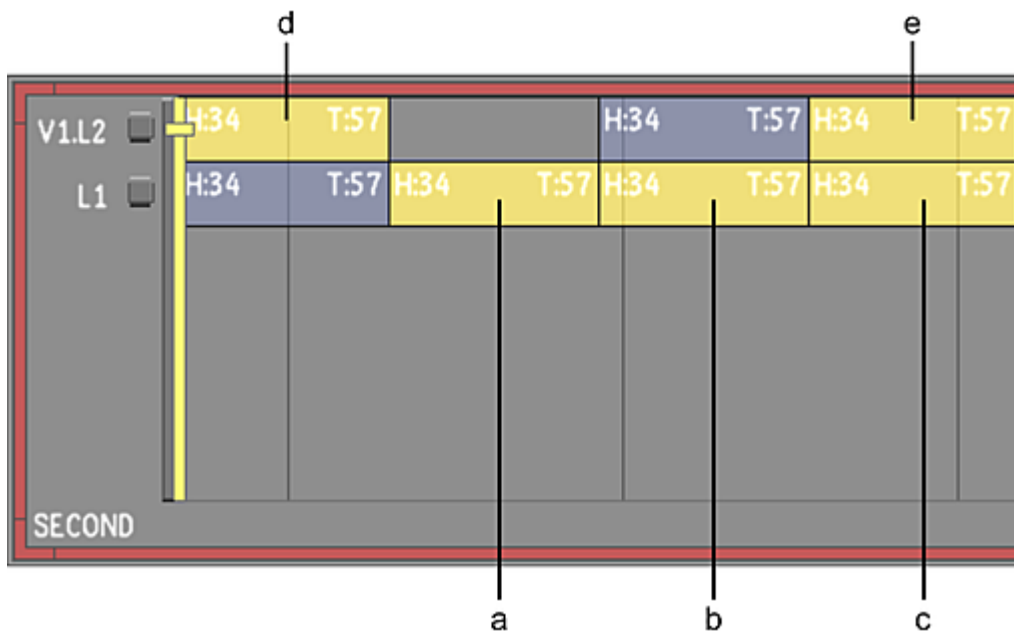
When you enable the collapse function, Lustre disables the Edit, Dissolve, Editing > Timeline, and Colour > Timeline menus. If you are in one of these menus when you enable the collapse function, Lustre takes you to the Colour > Grading menu. This behaviour guards against accidentally modifying the editorial structure on footage not being displayed while in the collapsed view.

The viewing order of shots in the collapsed view of the Storyboard starts from shot 1 in Layer 1 and goes to the last shot in Layer 1 before starting on the first shot of Layer 2.

In the following example, all shots on all layers are selected. The order in which shots are displayed in the Storyboard when the collapsed view is enabled is from a to g.



In the following example, several shots are selected and some are not. The order in which shots are displayed in the Storyboard when the collapsed view is enabled is from a to e.



To align all shots on all layers into a single Storyboard sequence:

- 1 In the multi-layer timeline, select all shots on all layers. See [Selecting Elements](#) (page 283).
- 2 Press **F** on the keyboard, or enable the **C** button.



All shots on all layers are displayed in the Storyboard.

NOTE To disable the collapse function, press **F** on the keyboard again, or click the **C** button again.

To align a selection of shots from one or more layers into a single Storyboard sequence:

- 1 In the multi-layer timeline, select the desired shots. See [Selecting Elements](#) (page 283).
- 2 Press **F** on the keyboard, or enable the **C** button.

All selected shots are displayed in the Storyboard.

NOTE To disable the collapse function, press **F** on the keyboard again, or click the **C** button again.

Setting the Viewing Options

Player: viewing multiple shots; Single view, enabling; colours: setting Colour view in the Player; Player: setting Colour View viewing: multiple shots in the player Lustre has several ways to view and work with single or multiple shots in the Player or the SDI monitor.

Within the Viewing Options, you can select the following:

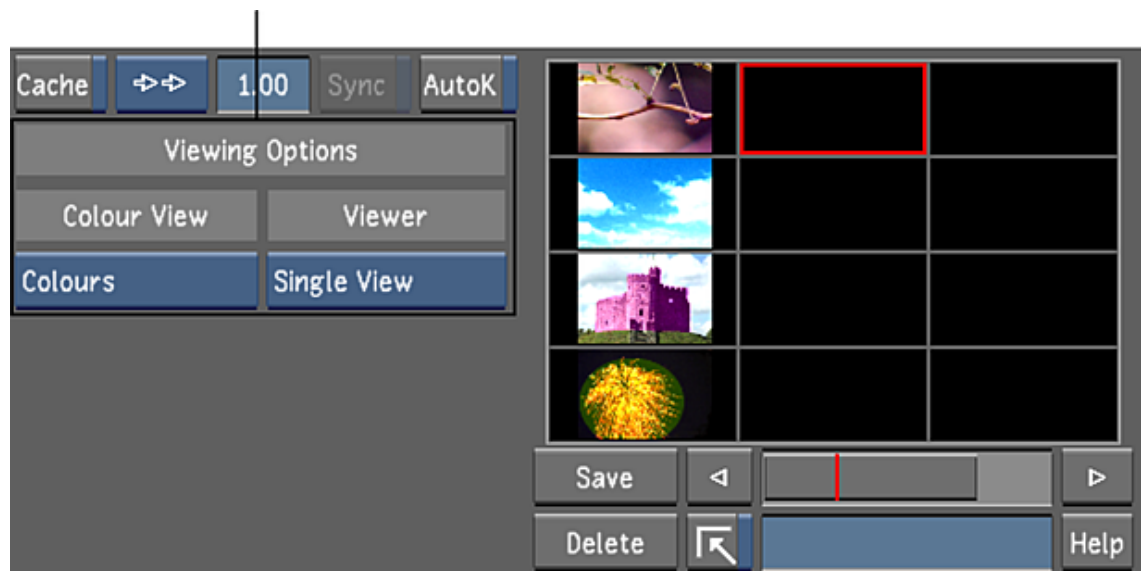
- **Colour View** You can display all of the colour channels of an image, or individual channels in greyscale. The greyscale versions of colour channels represent, in values of grey, the amount of that colour channel found in each part of the image. The darker the grey, the greater the amount of colour present.
- **Single View** This is the default viewer. You can select which playhead you want to display in the Player (i.e., Playhead A or B).
- **Dual View** You can display the image of Playhead A and Playhead B at the same time. See [Using Dual View](#) (page 334).
If you are working in a stereoscopic project, you can also use this mode to display the image for the Left and Right Eye of the current frame at the same time. See [Viewing Stereoscopic Footage in Dual View](#) (page 585) .
- **Multi View** You can display 2, 4, 9, or 16 shots. See [Using Multi View](#) (page 336).

To enable the viewing options:

- 1 Enable the Viewing Options button. The look of this button depends on the viewing option that is currently selected.



The Viewing Options panel appears to the left of the Grade bin.



- 2 Select the colour view option.
Cycle through the following options:
 - Colours
 - Red Channel

- Green Channel
- Blue Channel
- Luminance

3 Select the number of shots to view using the Viewer option box.

Select:	To display:
Single View	The default viewer. The viewer displays the image of the current playhead.
Dual View	The images of Playhead A and Playhead B. See Using Dual View (page 334). For a stereoscopic project, it displays either Playhead A and Playhead B, or the Left Eye and the Right Eye. See Viewing Stereoscopic Footage in Dual View (page 585).
Multi View	2, 4, 9, or 16 shots. See Using Multi View (page 336).

The Viewing Options are also accessible through the Autodesk Control Surface panel. See: [Player Viewing Options](#) (page 826) in “The Autodesk Control Surface” chapter of this User Guide.

To return to the Single view:

- 1 Do one of the following:
 - Press F5.
 - Right-click the Viewing Options button.

This returns you to the default Single view.

NOTE Disabling the Viewing Options button does not disable the viewing options you have selected.

Using Dual View

Dual view:enablingThe two images displayed in Dual view are the current frames on Playheads A and B. Dual view is useful for matching two shots or for copying colour correction parameters from one shot to another. You can view images side by side, or use a wipe. With a wipe (i.e., horizontal or vertical), you see a portion of each image. You can control the position of the wipe bar by adjusting the Value slider.

In a stereoscopic project, you can view the image of the Left Eye in one viewer and the image at the same frame of the Right Eye in the other. See [Viewing Stereoscopic Footage in Dual View](#) (page 585).Refer to “Viewing Stereoscopic Footage in Dual View” in the “Stereoscopy” chapter of the *Lustre User Guide*.

To display Dual view:

- 1 Do one of the following:
 - Enable the Viewing Options button, and in the Viewer option box, select Dual View.
 - With the Viewing Options button enabled, press F3 or click the Viewer option box to cycle through the viewer options until Dual View is displayed.
 - If you are in Single view, and the previous mode was Dual view, press F5 to toggle between the two views.
The last used mode in Dual view is displayed.
- 2 Press F4 to cycle through the display modes.
 - **2-up** The current frames on Playheads A and B are displayed side by side.



- **Horizontal Wipe** The images assigned to Playheads A and B appear on the top and bottom, respectively.



- **Vertical Wipe** The images assigned to Playheads A and B appear on the left and right, respectively.



TIP When applying a wipe, use the Value slider to edit the percentage of the viewer that displays the image on Playhead B.

NOTE If you are working in a stereoscopic project, you can blend the Right Eye image over the Left Eye. See [Viewing Stereoscopic Footage in Dual View](#) (page 585).

Using Multi View

Multi view: enabling Multi view is useful for viewing your sequence in a Storyboard format while developing continuity between shots. With Multi view, you see the entire image, and you can cycle through viewing 2, 4, 9, or 16 shots.

To view multiple shots simultaneously in the Player:

- 1 (Optional) Select up to 16 shots. See [Selecting Shots in the Storyboard](#) (page 328).

NOTE If you do not select any shots, you will see the first shots in the sequence in Multi view.

- 2 Do one of the following:
 - Enable the Viewing Options button, and in the Viewer option box, select Multi View.
 - With the Viewing Options button enabled, press **F3** or click the Viewer option box to cycle through the viewer options until Multi View is displayed.
 - If you are in Single view, and the previous mode was Multi view, press **F5** to toggle between the two views.
The last used Multi view mode is displayed.
- 3 Press **Ctrl+F5** to cycle through the display modes.



The first two shots displayed are the current frames on Playheads A and B. The rest of the shots displayed are the selected shots, displayed sequentially from left to right in the order of selection.

NOTE If no shots are selected, after the first two shots, shots starting at the third shot in the cut are displayed sequentially from left to right.

- 4 (Optional) Pan the displayed shots by holding and dragging the middle mouse button within the Player, or scale the displayed shots by holding and dragging the middle and right mouse buttons within the Player.

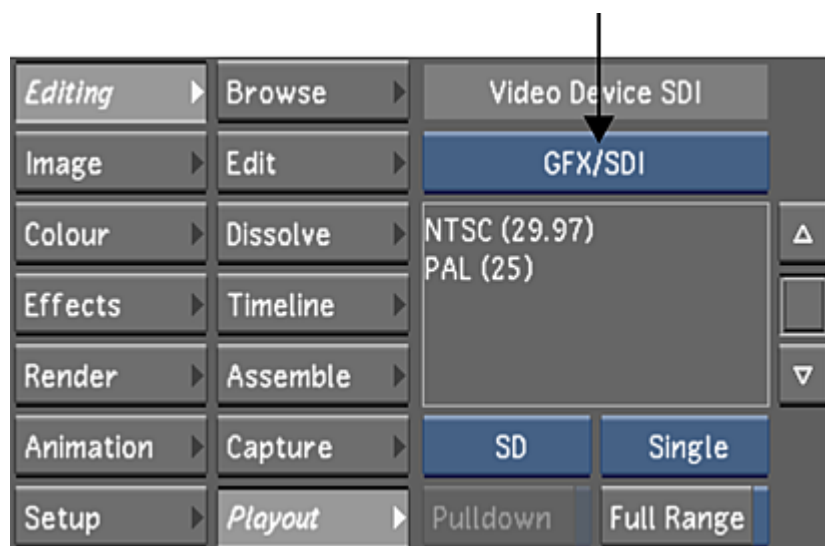
You can make a new selection of shots while you are in Multi view. After you have selected the new shots, press **F6** to update the Multi view display with the new shots.

Viewing Multiple Shots on the SDI Monitor

SDI monitor,viewing multiple shots;Dual view:viewing on the SDI monitor;Multi view:viewing on the SDI monitorviewing:multiple shots on the SDI monitorYou can use Dual view and Multi view in the SDI monitor.

To view multiple shots on the SDI monitor:

- 1 Click **Editing** in the Main menu, and then click **Playout**.
The Playout menu is displayed.
- 2 Make sure **GFX/SDI** is selected in the Video/Graphics Raster option box.



- 3 From the Raster list, select the video resolution and scan mode that corresponds with your footage.
- 4 Press **F7** to activate the SDI output mode.
- 5 Complete one of the following:
 - To view two frames on the SDI monitor, perform the procedure for viewing two frames. See [Using Dual View](#) (page 334).
 - To view multiple shots on the SDI monitor, perform the procedure for viewing multiple shots. See [Using Multi View](#) (page 336).

NOTE You cannot view horizontal wipes, vertical wipes, or blends on the SDI monitor.

Timeline Sort Mode

Timeline:sort modeTimeline sort modeSometimes it may be easier for you to grade a timeline if the shots are in a different order than the final sequence. You can rearrange the order of the shots so common shots are grouped together, graded, and then returned to their original order. The timeline sort mode allows you to do this. You can modify the order of the shots in your assembled EDL and then apply grading to those shots. Once you have finished grading the sorted shots, you can output the shots to a VTR (via the write telecine tape feature), save the shots as a new cut, or return the shots to their original order. You can sort the shots either by the record timecode or by the reel name and source timecode.

By default, all the shots are sorted into a single layer when you use the timeline sort mode (whether you are sorting a single-layered timeline or a multi-layered timeline). You can also choose to sort only the selected shots within the timeline. If you are working with a multi-layered timeline, be aware of layers that are muted or if a layer is soloed. If a layer is soloed, then only the shots in that layer can be sorted. If any layers are muted, the shots within those layers cannot be sorted. As well, the same shot can appear in numerous layers. These shots are sorted from the bottom to top layer.

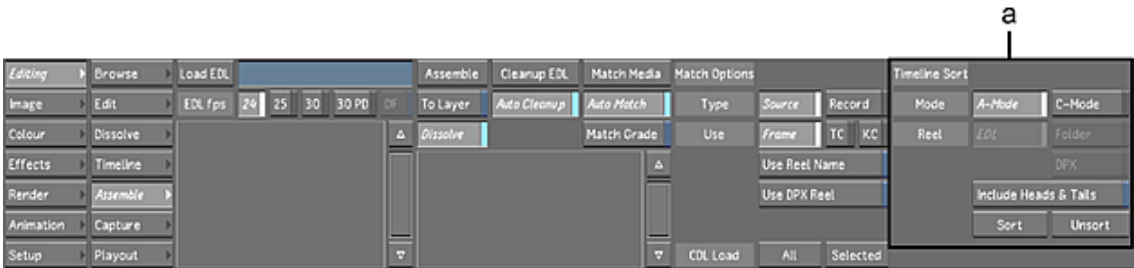
When the timeline is sorted, only the source media is shown, therefore, you cannot modify or collapse the timeline and dissolves and retimes are not visible. The Edit and Dissolve menus are greyed out and all the options within the Timeline menu and the Colourist Timeline menu are also greyed out. You also cannot add or delete shots while the shots are sorted.

Accessing the Timeline Sort Feature

Timeline sort mode:accessing Timeline sort modeTo sort the shots within your timeline, you can access the Timeline Sort section in the Assemble menu.

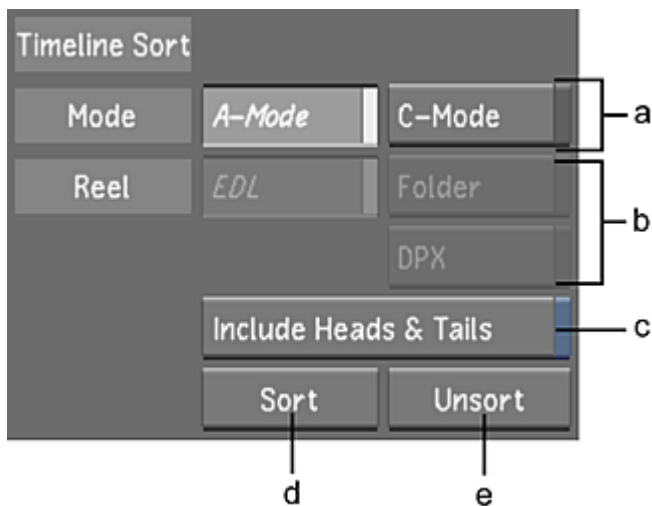
To access the Timeline Sort feature:

- 1 In the Main menu, click Editing.
 - 2 Click Assemble.
- The Timeline Sort section appears.



(a) Timeline Sort mode buttons

The Timeline Sort section is made up of the following buttons.



(a) Sort mode options (b) Reel options (c) Heads & Tails button (d) Sort button (e) Unsort button

A-Mode button When enabled, this sorts either the entire timeline or selected shots by the order of the shots in the sequence. If you have a multi-layer timeline, the shots are organized by their time location in the sequence. See [Sorting with A-Mode](#) (page 339).

C-Mode button This mode sorts either the entire timeline or the selected shots by the reel name and the source timecode. The Reel options (e.g., EDL, Folder, and digital picture exchange (DPX)) are only available for a C-mode sort. See [Sorting with C-Mode](#) (page 341).

EDL button The EDL option sorts the shots by the EDL reel name (in ascending alphanumerical order) and by source timecode.

Folder button This option sorts the shots according to the folder name (or directory if you are using Linux) your scans or footage are saved into and by source timecode.

DPX button Shots are sorted by DPX reel name and source timecode.

Include Heads & Tails button When enabled, the sorted shots' heads and tails portions are expanded to let you see and work on the entire shot. It also allows you to work on other parameters (e.g., animation, tracking feature, etc.) without disturbing the initial edits (such as dissolves). This option is available for both A-mode and C-mode and is disabled by default.

Sort button Once a sort mode, a reel option (if applicable), and the heads and tails option have been selected, click Sort to organize your shots according to those criteria. The editing tools are disabled and a green border appears around the timeline canvas.

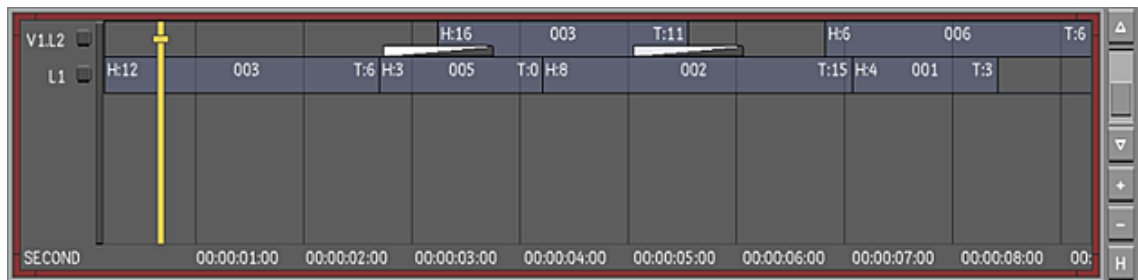
Unsort button Click Unsort to return the timeline back to its original sequence. The editing tools are enabled.

Sorting with A-Mode

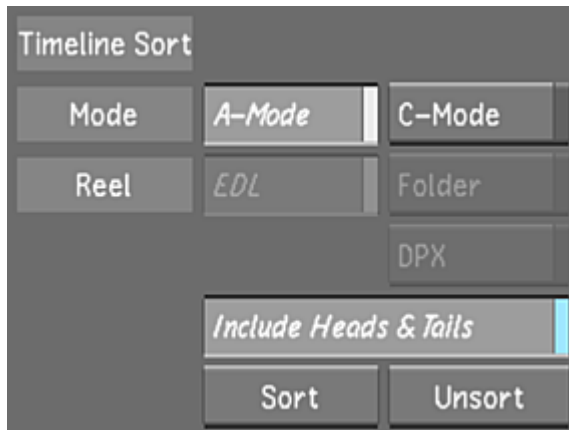
A-mode sort Timeline sort mode: A-mode When you use A-mode to sort your timeline, your shots are organized according to their time location within the sequence (i.e., the record timecode). The shots are displayed one after another on a single layer and any dissolves and retimes are not displayed.

To sort the shots using A-mode sort:

- 1 Click Editing and then click Assemble to display the Timeline Sort section.
- 2 Select the shots you want to sort. If you want to sort the entire timeline, you do not need to select any shots.



- 3 Enable the A-Mode button and choose whether you want the head and tail frames to be exposed.



NOTE If any of your shots have a retime value with heads and tails, the Retrim button (in the Edit menu) must be enabled so the sort function can calculate the handles properly.

- 4 Click Sort.

The shots are now sorted by the record timecode. A green border appears around the timeline canvas to indicate that you are working in a sorted timeline.

NOTE You cannot do any editorial work or delete and add shots while you are in the sorting mode. As well, undo actions are disabled.

Once you have completed grading the shots, you can do one of the following:

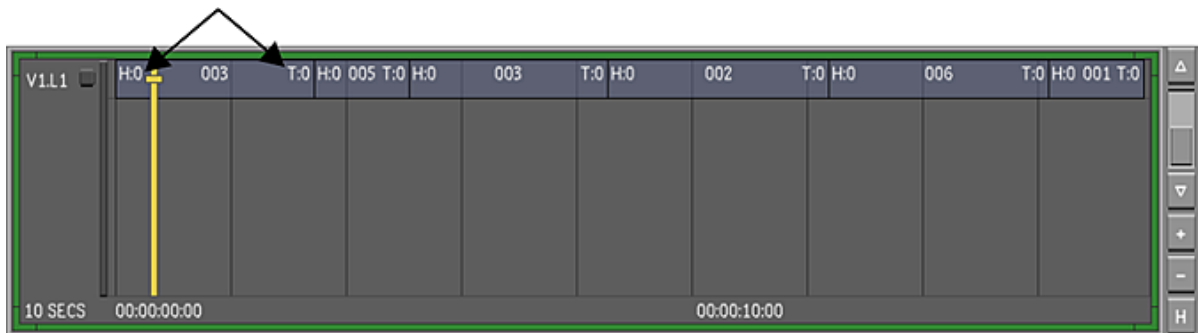
- Create a new cut list with the sorted shots. See [Creating a New Cut](#) (page 102).
- Render the sorted shots. See [Rendering Shots](#) (page 591).
- Play out the sorted shots to a VTR. See [Playing Out to a VTR](#) (page 662) and [Writing Telecine-Style Tape](#) (page 672).
- Return the sorted shots to their original order.

To return the sorted shots to their original order:

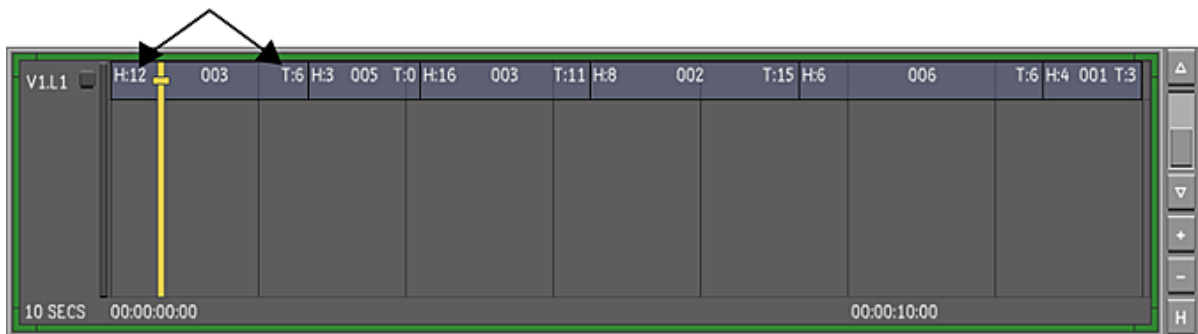
- 1 Do one of the following:
 - Click Unsort.
 - Press **Alt+F8**.

A-Mode Sort Using Hotkeys

Timeline sort mode:hot keysYou can also sort the shots, without accessing the Assemble menu, by using hotkeys. Press **Alt+F9** to sort the shots in A-mode and enable the heads and tails. The heads and tails are showing 0 (zero) so you can work on every single frame within the shot.



Press **Alt+F10** to sort the shots in A-mode and for head and tail frames to remain unexposed (disabled).



Sorting with C-Mode

C-mode sortTimeline sort mode:C-modeWhen you sort the timeline with C-mode, you are organizing the shots based on the reel name and the source timecode. If the shot does not have a reel/folder name, then the source timecode is used for sorting. The shots are displayed one after another on a single layer and dissolves and retimes are not displayed. You can choose to have your timeline sorted by EDL reel name, folder name, or DPX reel name.

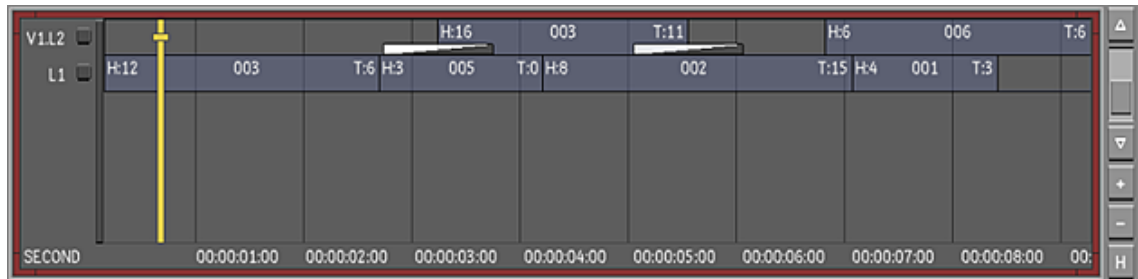
You want to sort the shots by EDL if you are working with a cut that has been assembled from an EDL, or a cut that is based on a Wiretap EDL. When you sort the timeline using the EDL option, the shots are arranged by the EDL reel name in alphanumerical order (numerical before alphabetical), and then by source timecode in ascending order (e.g., from 00:00:00:00 to 23:59:59:29). This data is read from the cut file EDLReelName XML tag.

If you are sorting the timeline with the Folder option, the shots are arranged in alphanumerical order (numerical before alphabetical) by the folder or directory name where you are storing your scans or captured footage (see [Recommended Directory Structure for Projects](#) (page 59)). You can view the folder name in the file browser. This data is retrieved from the cut file AliasName XML tag. This tag is based on the name of the reel folder or directory when you are working with imported scans or captured footage.

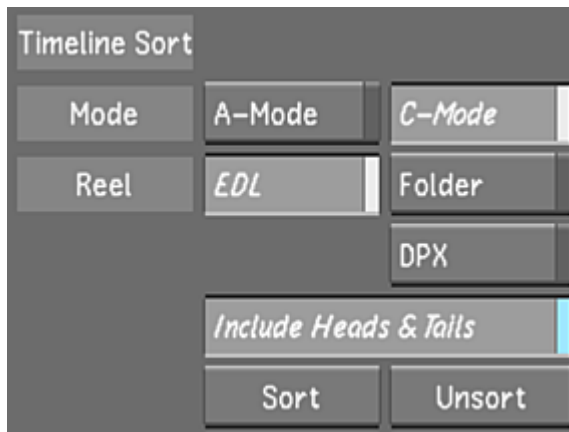
Lastly, you can sort the timeline of DPX files by their reel name. This data is read from the XML tag DPXReelName within the cut file. This XML tag is based on the data in the DPX header of the imported film scans. For more information on XML tags, see [XML in Lustre](#) (page 749).

To sort the shots using C-mode sort:

- 1 Click Editing and then click Assemble to display the Timeline Sort section.
- 2 Select the shots you want to sort. If you want to sort the entire timeline, you do not need to select any shots.



- 3 Enable the C-Mode button, choose a Reel option, and choose whether you want the head and tail frames to be exposed.



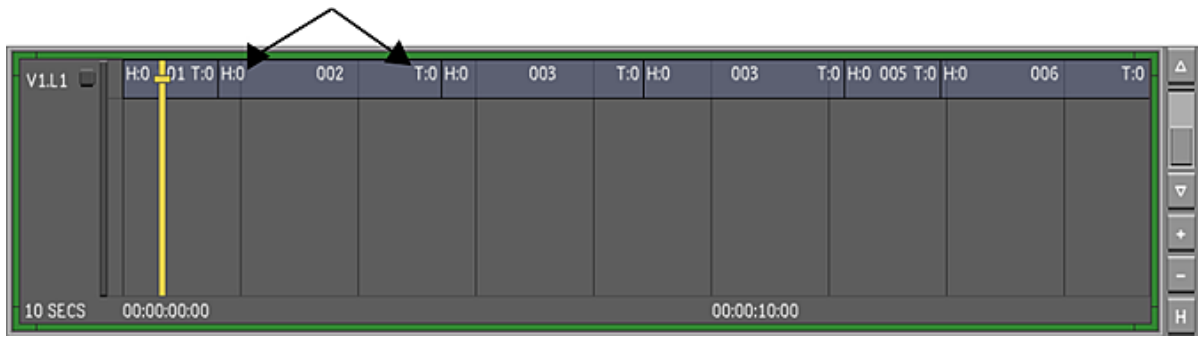
NOTE If any of your shots have a retime value with heads and tails, the Retrim button (in the Edit menu) must be enabled so the sort function can calculate the handles properly.

- 4 Click Sort.

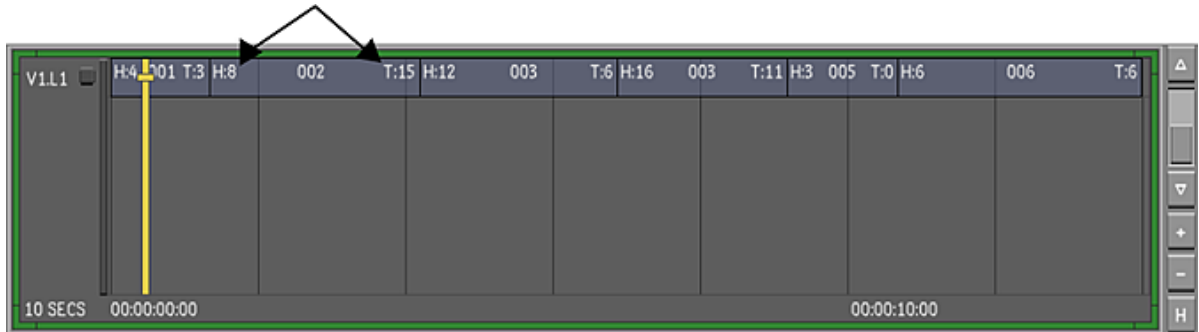
The shots are now sorted according to your criteria. A green border appears around the timeline canvas to indicate that you are working in a sorted timeline.

NOTE You cannot do any editorial work or delete and add shots while you are in the sorting mode. As well, undo actions are disabled.

The following image is a C-mode sort using the EDL option with heads and tails enabled. The heads and tails are showing 0 (zero), so you can work on every single frame within the shot.



This image shows the timeline being sorted by the C-mode EDL option and the heads and tails are disabled.



Once you have completed grading the shots, you can do one of the following:

- Create a new cut list with the sorted shots. See [Creating a New Cut](#) (page 102).
- Render the sorted shots. See [Rendering Shots](#) (page 591).
- Play out the sorted shots to a VTR. See [Playing Out to a VTR](#) (page 662) and [Writing Telecine-Style Tape](#) (page 672).
- Return the sorted shots to their original order.

To return the sorted shots to the original EDL:

- 1 Do one of the following:
 - Click Unsort.
 - Press **Alt+F8**.

C-Mode Sort Using Hotkeys

Timeline sort mode:hot keysYou can also sort the shots without accessing the Assemble menu. You can sort the shots by using the hotkeys.

Press:	To:
Alt+F11	Sort the timeline in C-mode by EDL reel name and heads and tails are enabled.
Alt+F12	Sort the timeline in C-mode by EDL reel name and heads and tails are disabled.
Ctrl+Alt+F11	Sort the timeline in C-mode by folder name and heads and tails are enabled.
Ctrl+Alt+F12	Sort the timeline in C-mode by folder name and heads and tails are disabled.

Press:	To:
Ctrl+Alt+Shift+F11	Sort the timeline in C-mode by DPX reel name and heads and tails are enabled.
Ctrl+Alt+Shift+F12	Sort the timeline in C-mode by DPX reel name and heads and tails are disabled.

Caching Frames to Memory for Real-Time Playback

real-time playback:with frame cachingcaching:for real-time playbackAfter applying many effects to a shot, you may no longer get real-time playback. To play shots with many effects in real time, you can render and temporarily cache the rendered frames into memory.

You can also navigate through shots with the control surface.

NOTE You can also obtain real-time playback by first rendering the shot from the Render Local menu, or with background rendering, and then using the P view mode to play the shot. See [Rendering](#) (page 591) and [Setting the View Mode](#) (page 320).

To view shots in real time with memory caching:

- 1 Go to the frame where you want to start viewing in real time.
- 2 Specify looped playback of the current shot, the entire Storyboard, or between in and out points by clicking the Play Mode button. See [Playing Shots](#) (page 315).
- 3 Enable Cache.



The application renders the current frame and caches the result in memory. It continues forward through the shot or cut (depending on the state of the Play Mode button), caching each frame to memory.

- 4 Click the Stop playback control at the frame where you want to stop caching. Otherwise, caching continues to the end of the shot or cut and then looped playback starts.
- 5 If you stopped caching, press the Play control to start looped real-time playback of the cached frames.
- 6 Use the playback controls to view the cached frames as needed, keeping the Cache button enabled. The cached frames remain in memory until you disable Cache.
- 7 When you have finished viewing the cut, disable Cache by clicking it again or press N to disable memory caching.

Player Hotkeys

full-screen Player:using hotkeysPlayer:using hotkeyshotkeys:for Player and full-screen PlayerFollowing is a list of hotkeys and mouse gestures commonly used in the Player and the full-screen Player.

Press:	To:
Enter	Toggle full-screen Player mode.
Spacebar	Start or stop playback in the direction last played.
Up Arrow	Start forward playback.
Down Arrow	Start backward playback.
Right Ctrl (right hand side of keyboard)	Frame step forward.
Right Alt (right hand side of keyboard)	Frame step backward.
Shift+I	Mark an in point for loop play.
Shift+O	Mark an out point for loop play.
Shift+L	Clear in and out points.
. (decimal point on the numeric keypad)	Toggle through play modes (loop timeline, loop shot, and loop in and out points).
Shift+Spacebar	Switch to P (Print) view mode, open the full-screen Player and start playback.
Middle mouse button and drag	Pan the image.
Middle and right mouse buttons and drag	Zoom into or out of the image.
F1	Display the current frame on Playhead A.
F2	Display the current frame on Playhead B.
F5	Toggle between the current view and Single View.
F3	Cycle between Single View, Dual View and Multi View.
F4	Activate Dual View. In Dual View, cycle between Dual View options.
F6	Update multi-view with the new selection.

Press:	To:
F7	Display the Timeline, Player, grading tools, and whichever keyer (HLS or Diamond) is enabled. Also activate the SDI out if the GFX SDI is enabled.
F9	Toggle between full- and half-resolution in the Player.
Tab	Display and hide the Storyboard.
Q	Toggle between regular and large Storyboard view.
M	Enable memory caching.
N	Disable memory caching.
Alt+1	Display R, G, and B colour channels separately in the waveform monitor.
Alt+2	Display the histogram.
Alt+3	Display R, G, and B colour channels together in the waveform monitor.
Alt+4	Display the vectorscope.

Removing Dust

14

removing, dust and other artefacts [dust removal:overview](#) Use the Dust Removal tools in Lustre to remove dust, hair, speckles, and other artefacts on your shots. Lustre removes artefacts for you by cloning pixels over them. The cloned pixels may come from the identical location on the previous and next frames, or from the area surrounding the artefact on the current frame, depending on the repair method that you use. You can locate artefacts on each frame yourself, or use an automatic method of artefact detection over one or more shots.

Dust removal can be done at any time in the project workflow. Also, you can do more than one dust removal pass on the footage. For example, you may choose to perform the main dust removal early on in the project, render the results, and then do a final pass (quality check) after all colour grading is complete.

You can perform dust removal on the original 2K shots or on 1K generated proxies. Working on the 2K version may provide more accurate removal. However, the process will be completed more quickly when using 1K proxies, particularly in the case of automatic removal.

Dust metadata is saved independently of the colour grading data, in a text file stored with the footage. This makes it possible to remove dust on one system while grading on another. You can then combine the metadata into one completed project. Dust removal is non-destructive to the original footage. If you decide to replace the original footage with cleaned up frames, a copy of the original frame is saved and given a unique name. This file can be restored if needed.

Preparing for Dust Removal

Before removing dust artefacts from your shots, there are several things you should do:

- Identify the best repair type for your footage.
- Determine if you should be using the manual or automated method.
- Optimize the dust removal options for the characteristics of your shots.

Deciding on a Repair Type

repair type, selecting for artefact removal [dust removal:choosing a repair type](#) To remove artefacts, you can use either the Motion Estimation or Single Frame repair type.

With Motion Estimation, Lustre looks for colour differences between the current frame, the previous frame, and the next frame within a specified area, and differentiates between motion in the shot and artefacts using motion estimation calculations based on a specified search area. Large search areas are needed for shots with fast motion since the colour differences between frames will span a larger area than would be required for shots with slower motion. If a colour difference is found between adjacent frames, and is not identified as

motion in the shot, it is assumed to be dust. To remove an artefact, Lustre creates a mask for it using a calculation that uses the pixel values on the previous and next frames at the identical location as the artefact.

The Single Frame repair type removes artefacts by cloning pixels adjacent to the artefact on the current frame rather than using pixel values from the previous and next frames.

Generally speaking, the Motion Estimation repair type does a better job than Single Frame, and it should be used when possible. Try Single Frame if the characteristics of the shot or the artefacts prevent the Motion Estimation repair type from successfully identifying and removing artefacts. For example, you will need to use Single Repair if an artefact appears on more than one frame.

Deciding on Manual or Automated Dust Removal

automated dust removal:overviewmanual dust removal:overviewdust removal:choosing manual or automatedThere are two methods you can use to remove artefacts—manual or automated. With the manual method, you visually identify artefacts frame by frame and specify the area where you want to apply a mask by drawing boxes around them as you go along. With the automated method, Lustre searches for artefacts and creates the boxes automatically, based on search criteria that you specify.

These methods of dust removal only apply to motion estimation.

The method you choose depends on the nature of your footage—how much dust is on it and the complexity of the motion in it. Automatic removal is faster, but you may experience problems with it if the footage has a lot of fast motion or highlights in the motion or elsewhere in the footage. In this kind of footage, the automatic method may mistakenly identify motion as dust, and the clean up job afterwards may be more effort than using manual removal. As a general rule, choose manual removal for footage with complex motion and little dust (most normal feature work), and automatic removal for footage with less motion and large amounts of dust.

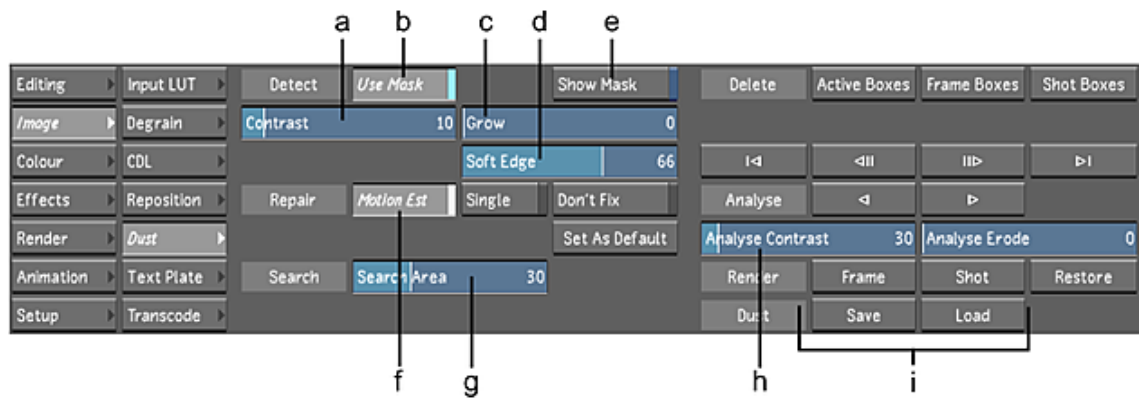
Optimizing Dust Detection

parameters:optimizing for dust removaldust removal:optimizing parametersFor most shots, when you set dust removal parameters for one dust artefact, the settings will work well for other artefacts in the shot. Prior to removing dust either manually or automatically, set parameters in the Dust menu to the best settings for the amount of motion and the colour composition of your shot. When the settings are optimized, save them as default settings so they will be applied to all newly created mask boxes.

The optimization settings apply only to dust removal methods that are based on motion estimation.

To optimize dust removal settings:

- 1 In the Main menu, click Image.
- 2 Click Dust.
The Dust menu appears.



(a) Contrast field (b) Use Mask button (c) Grow field (d) Soft Edge field (e) Show Mask button (f) Motion Estimation button (g) Search Area field (h) Analyse Contrast slider (i) Dust Save and Load buttons

3 Enable Use Mask.

Lustre will create masks for any artefacts it finds inside dust removal boxes, based on the Contrast and Grow parameters.

4 Enable Motion Estimation.

This repair type uses a motion estimation calculation to identify motion in successive frames.

5 Set the Search Area.

This parameter controls the size of the area (in pixels) around each pixel in which the motion estimation calculation searches for motion. This enables Lustre to differentiate between motion in the shot and dust artefacts. Estimate the approximate search area required for the amount of motion-caused colour displacement between frames. Set a large area for shots with fast motion, and a small area for shots with slower motion.

NOTE If the area set is too small for the speed of the motion, the calculation may mistakenly define colour value differences between frames caused by motion as dust artefacts. However, larger search areas take longer to analyse.

6 Adjust the Analyse Contrast slider to set the amount of contrast used to find dust during automatic analysis.

Low contrast values cause the algorithm to accept low colour value differences between corresponding pixels on the current, previous, and next frames. Therefore, low values result in more complete removal of the artefact. However, if the contrast is set lower than actually needed, adjacent pixels are modified more than actually required to remove the dust.

7 On the shot you are working on, find a frame containing an artefact that is typical of the artefacts on the footage. Use the Next Frame and Previous Frame buttons or **Ctrl** and **Alt** hotkeys to move forward and backward through the shot.

Zoom in closely on a dust artefact by pressing the middle and right mouse buttons and dragging on the image. You should be close enough to see pixels.

8 Draw a box around the dust artefact by dragging the cursor diagonally across the artefact and then releasing the cursor. Surround the artefact closely, but make the box large enough to leave a radius of 5 to 10 pixels around the artefact. See [Working with Boxes](#) (page 353).

The artefact is repaired according to the current settings. It should be fainter or have disappeared completely.

9 Enable Show Mask.

Red pixels identify those areas affected by the removal process.

10 Adjust the Contrast value.

Low values result in more complete removal of the artefact. However, if the contrast is set lower than actually needed, adjacent pixels are modified more than actually required to remove the dust. Increase (or decrease) the Contrast value until right before the dust starts to reappear.

- 11 Adjust the Grow parameter and the Soft Edge parameter until the red pixels exactly cover the dust particle.

The Grow parameter controls the number of pixels around the pixels detected by Lustre. The Soft Edge parameter softens the stroke of the pixels specified by the Grow parameter in order to replicate a natural paint stroke.

- 12 Turn off Show Mask.

- 13 Click Set As Default.

The values you just set for all parameters are now default values that will be applied to any new box created either manually or automatically.

You have now set Dust Removal parameters to their optimum values for the shot and you are now ready to remove dust from the rest of the shot using either the manual or automatic method.

Removing Dust Manually

manual dust removal:performing manualTo remove dust manually, you scan each frame visually for dust artefacts and draw boxes around any artefacts that you find.

To remove dust manually:

- 1 Follow all steps in [Preparing for Dust Removal](#) (page 347).
- 2 Go to the first frame of the shot where you want to find and remove dust.
- 3 On the image window, drag a box around each dust artefact that you find. Make the box as small as possible—to just surround the dust and leave five to ten pixels of space around the artefact. This reduces the portion of the image that is affected by the removal process. See [Working with Boxes](#) (page 353).
- 4 If needed, tweak the Contrast, Grow, and Soft Edge parameters. Enable or disable Show Mask as needed. Any changes you make are applied only to the artefact in the currently selected box.
- 5 Go to the next frame and check for artefacts, removing them as needed.
- 6 Continue the process frame by frame until the shot is cleared of artefacts.
- 7 If you are unable to successfully remove any artefacts, see [Single Frame Dust Removal](#) (page 352).

Removing Dust Automatically

automated dust removal:performing automatedYou can have Lustre automatically remove dust from each frame in the sequence by analysing the frames based on specified parameter values. Once the analysis is complete, you will need to verify that each box created is around a legitimate dust artefact, and you may need to tweak the settings for some boxes.

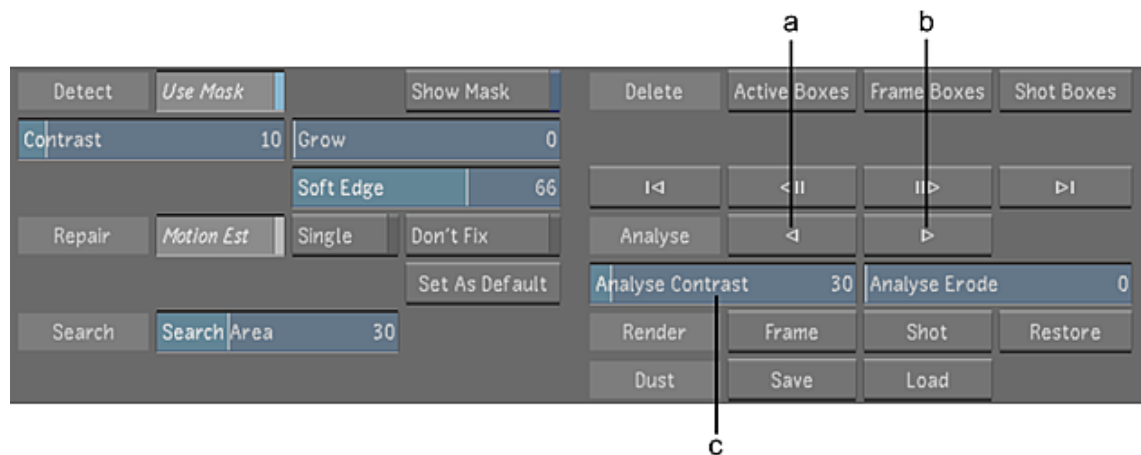
Analysing the Cut

Analysis starts at the current frame and continues from shot to shot until you stop it. You can analyse forward or backward through the cut.

To analyse a cut:

- 1 Optimize dust removal settings. See [Optimizing Dust Detection](#) (page 348).

- 2 Go to the frame where you want to start analysing.
- 3 Adjust the Analyse Contrast slider as needed.



(a) Backward Analyse button (b) Forward Analyse button (c) Analyse Contrast slider

Low contrast values cause the algorithm to accept low colour value differences between corresponding pixels on the current, previous, and next frames. Therefore, low values result in more complete removal of the artefact. However, if the contrast is set lower than actually needed, adjacent pixels are modified more than actually required to remove the dust.

- 4 Click the Forward Analyse or Backward Analyse button.
Lustre searches each frame for artefacts based on the parameters you set. It places an active box around each one it encounters and removes the artefact.

To stop the analysis:

- 1 Click anywhere in the grey area of the menu.
Lustre finishes analysing the frame currently being analysed then stops.

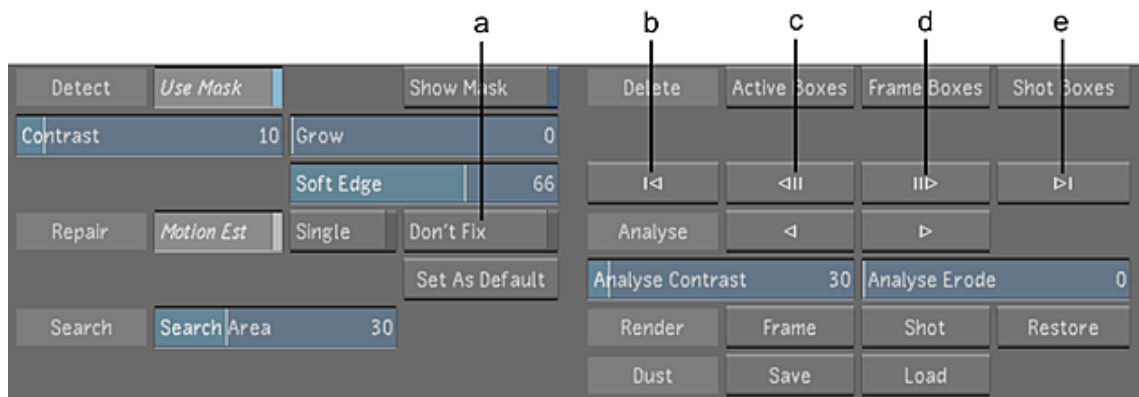
Post-Analysis Clean-Up

Verify the analysis and tweak the results if needed. You can delete any boxes that are not surrounding legitimate artefacts. You can also tweak the contrast setting on individual boxes if needed.

TIP If many boxes were created as a result of motion in the shot rather than dust particles, click Shot boxes to delete all boxes, increase the search area, click Set as Default again, and re-analyse the shot. You may need to experiment a bit to find the best value.

To tweak the analysis:

- 1 Visually scan the first analysed frame.
TIP To jump to the first or last frame in a shot where an artefact has been identified, use the First Analysed Frame button or the Last Analysed Frame button.
- 2 If you see a box that is not surrounding an artefact, or that you want to tweak, click inside it to select it.
It becomes the only active box on the frame.
TIP Click the Previous and Next Box buttons to move from box to box.



(a) Don't Fix button (b) First Analysed Frame button (c) Previous Box button (d) Next Box button (e) Last Analysed Frame button

- 3 If you need to see what has been removed, click Don't Fix. This shows you the contents of the box with no removal applied. If the artefact is genuine, click Motion Est again to reapply the Motion Estimation repair type.
- 4 Do one of the following as needed:
 - If the removed object is not an artefact, delete the box by clicking the Active boxes button.
 - If the object is an artefact but is not removed properly, tweak the Contrast, Grow and Soft Edge parameters. Enable or disable Show Mask as needed. When Show Mask is on, red pixels identify those areas affected by the removal process. Any changes you make are applied only to the artefact in the currently selected box.
- 5 If you are still unable to successfully remove the artefact, see [Single Frame Dust Removal](#) (page 352).

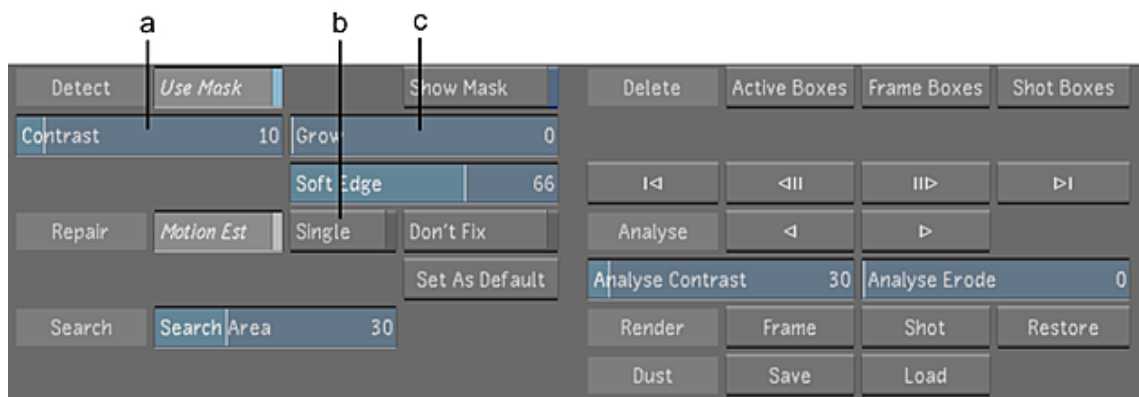
Single Frame Dust Removal

troubleshooting, problem dust artefactsdust removal:dealing with problem dust artefactsIn some cases, for example, when a dust artefact occurs in an area of very fast motion, the Motion Estimation repair cannot remove a dust artefact. When this happens, you have two methods you can use to remove the artefact. You can simply instruct the system to repair the entire contents of a box, or you can use a Single Frame repair to clone pixels in the area surrounding the problem.

If neither of these work, you can flag the artefact for later removal with the Can't Fix repair type. When you set a box to Can't Fix, no dust removal process is applied to the particle, and the x and y co-ordinates of the box are saved with the dust removal metadata. The removal of the artefact can then be performed using other methods. For example, a simple script could be written that would list the frames with "Don't Fix" boxes on them, and then send the files to a paint program.

To fix problem dust artefacts:

- 1 In the Main menu, click Image, and then click Dust to display the Dust menu.
- 2 Select the box surrounding the problem artefact.
All other active boxes on the frame are deselected.
- 3 Turn off Use Mask.
If the artefact is still visible, turn on Use Mask again and continue to step 4.
- 4 Click Single.



(a) Contrast field (b) Single button (c) Grow field

The box border changes from blue to green, indicating the applied Single Frame repair type.

- 5 Set the Contrast, Grow, and Soft Edge parameters to the optimum values. Use Show Mask as needed.

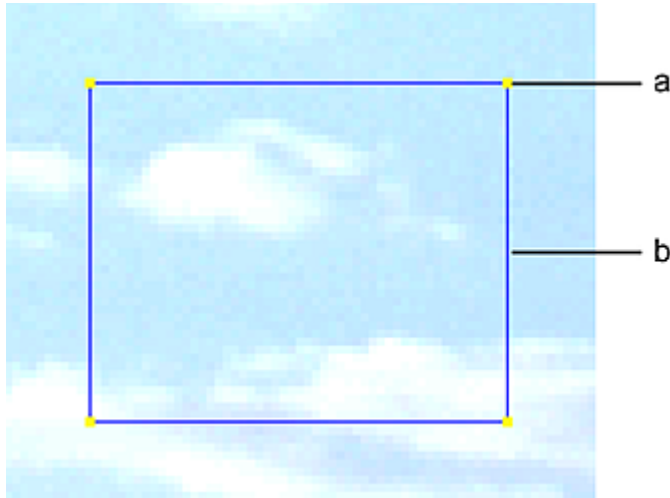
- 6 (Optional) If the artefact is still visible, set the repair type to Don't Fix.

The box border changes to red, indicating the applied Don't Fix repair type.

TIP To navigate between boxes set to Don't Fix, right-click the Previous and Next Box buttons.

Working with Boxes

boxes:adjusting for dust removaldust removal:drawing boxesWhether you choose the manual or automatic method of identifying dust artefacts, you will probably need to adjust the position or size of some boxes, or delete them. Following are basic procedures for working with boxes.



(a) Vertex (b) Border

To create a box:

- 1 Hold down the left mouse button and drag the cursor diagonally on the image.
- 2 Release the mouse button.

To select a box:

- 1 Click inside the box.

The box vertices turn yellow, indicating the box is active (selected). You can only select one box at a time.

To de-select a box:

- 1 Right-click inside the box.

To move a box:

- 1 Click inside the box and drag it.

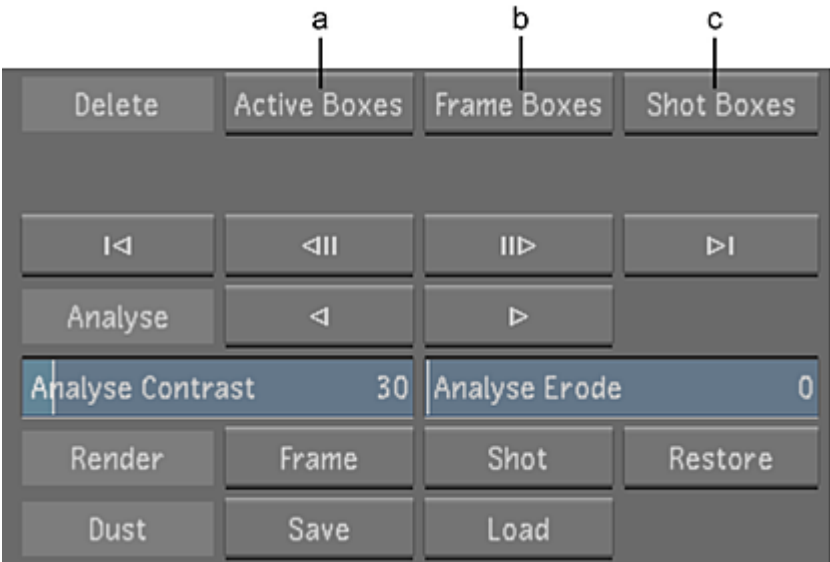
To re-size a box:

- 1 Click on a vertex and drag.

To delete one or more boxes:

- 1 Do one of the following.

To delete:	Do this:
The single active box	Select the box and press <code>Backspace</code> or click the <code>Active boxes</code> button.
All boxes on the current frame, whether active or not	Click the <code>Frame boxes</code> button.
All boxes on all frames in the current shot	Click the <code>Shot boxes</code> button.



(a) Active boxes button (b) Frame boxes button (c) Shot boxes button

Infrared Channel Dust Detection

infrared channel, using for dust removaldust removal:using the infrared channelThe infrared (IR) channel is available in DPX and Cineon 10-bit files that contain the SGI byte order. This IR channel is collected during the film scanning process at the same time as the visible colour channels (red, green, and blue).

Whereas film is mostly transparent to infrared radiation, dust and scratches are not and therefore appear in the IR channel. Once imported into Lustre, the information contained in the IR channel can be used to detect the appearance of dust and scratches to a higher degree than is possible using standard dust detection techniques.

NOTE IR dust detection is only available for the Master Station and the Lustre Station.

To perform IR dust detection:

- 1 With the clip loaded on the timeline, click the Analyse forward button while holding down **Ctrl**. The IR dust analysis begins, and boxes are placed around detected problems.
- 2 To reduce the amount of boxes that appear, increase the value in the Analyse Erode slider.

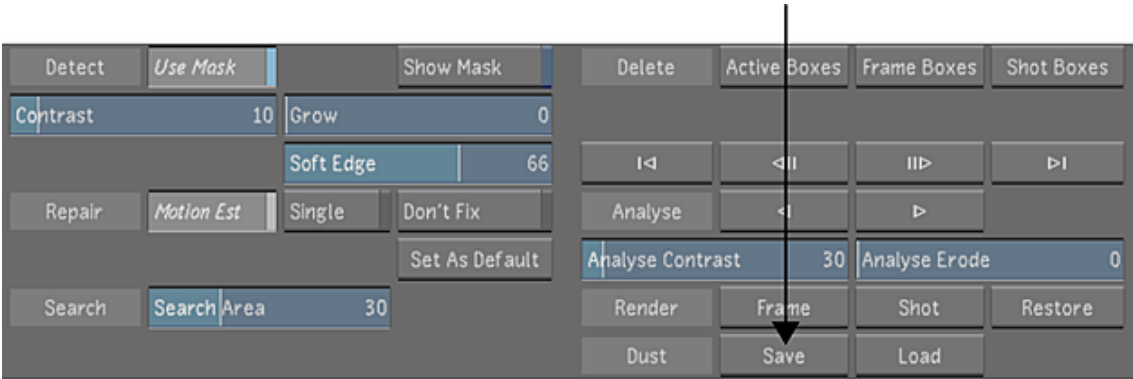
Options for Saving and Loading Dust Removal Metadata

metadata, saving for dust removaldust removal:saving metadataYou can save dust removal metadata manually, or automatically when you save the grade. In either case, the metadata is not saved in the grade file itself, but rather as a separate file called *dustbust.data*, located in the same directory as the original footage. See [Loading Grades for a Cut](#) (page 106).

When you save dust removal metadata manually, only the dust removal metadata is saved. If your timeline is long and has complex grading applied to it, saving dust metadata separately can save you time. You can also improve system performance by configuring Lustre to load grades without the corresponding dust removal metadata. If required, you can load the dust removal metadata later.

To save dust removal metadata manually:

- 1 In the Dust menu, click Save.

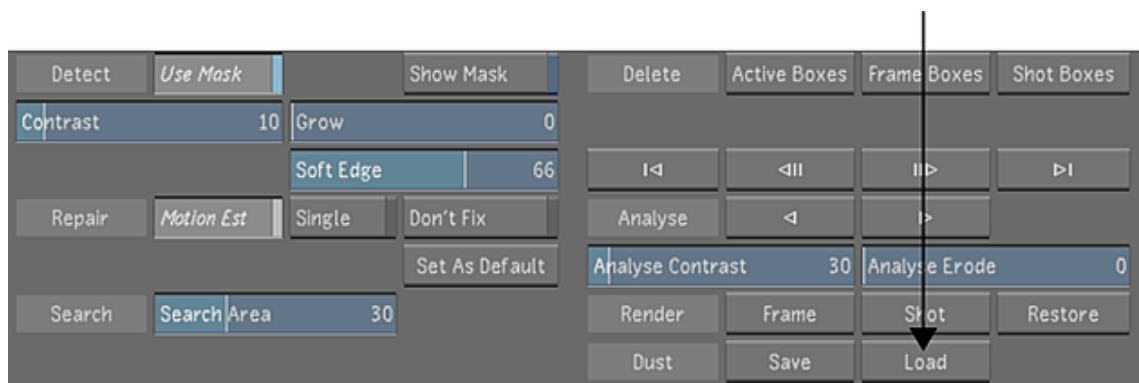


To ensure that dust removal metadata is not automatically loaded with the grade:

- 1 In the Setup > Settings menu, select Edit for the user settings.
- 2 In the Tools page, disable the Load Dust Data button.
Disabling this button ensures that dust removal metadata is not automatically loaded when you load the grade. This can save you time if you need to load a grade and do not mind seeing artefacts on your footage.

To load dust removal metadata after you have already loaded the grade:

- 1 In the Dust menu, click Load.



Rendering the Result

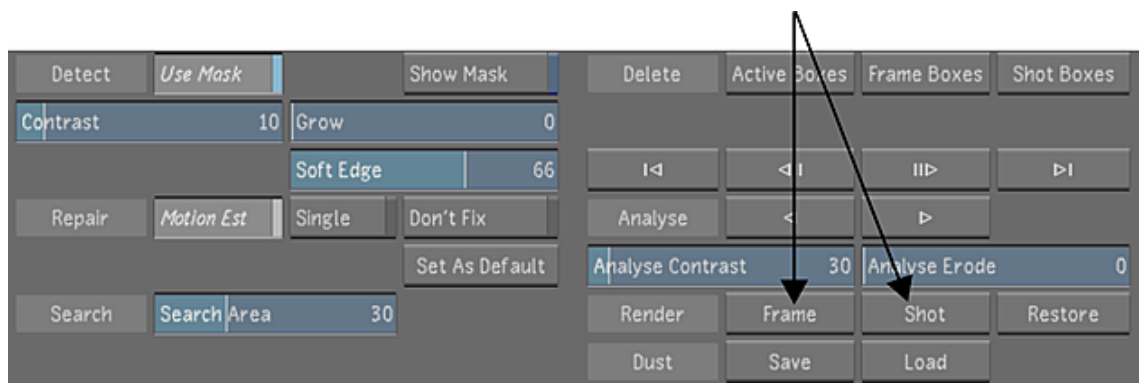
rendering:dust removal datadust removal:renderingWhen you are satisfied with the dust removal results, you can render your material. Two rendering options are available depending on whether you render using the Render menu or the Dust menu:

- When you render from the Render menu, you have the option of turning dust metadata on or off. When dust metadata is on, you render dust removal changes made to the grade. Otherwise, dust removal is not included in the render files. Render files are created for the entire region selected for render and saved to a separate directory. See [Rendering Shots](#) (page 591) and [Rendering Dust Metadata](#) (page 599).
- When you render from the Dust menu, the render files replace the original files, and the originals are backed up to a sub-directory called *Original*. You can therefore work with dust-free frames while continuing to point to the original footage directories during the course of the project. You can render the current frame or the shot. Only those frames containing changes are rendered. If you change your mind and want to revert to the original shot, you can restore it.

NOTE When you render from the Dust menu, the rendered result is visible from all menus except the Dust menu. In this menu, boxes and their settings remain in place, giving you the option to tweak them further and re-render if needed.

To render from the Dust menu:

- 1 Navigate to the shot containing frames you want to render.
- 2 Do one of the following:
 - To render the current frame, click Frame.
 - To render all frames in the shot that have been modified, click Shot.
 - To render the entire timeline, **Shift**-click the Shot button.



The frames are rendered.

To restore the original shot:

- 1 Navigate to the shot.
- 2 Click Restore and confirm by clicking it a second time.
The entire rendered shot is replaced with the original.

NOTE The boxes are retained. Therefore, if you want to start from scratch, you must delete the boxes first.

Removing Grain

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grain removal. See [Degrain workflow](#) Use the Degrain tool in Lustre to remove film grain, video noise, and other compression noise from your shots while minimizing damage to the image. Grain removal can be done at any time during the project workflow, but it is typical to perform an initial degrain operation on the source image before primary colour grading begins.

A recommended grain removal workflow consists of the following basic steps. You can view the result as you work. See [Viewing the Result](#) (page 360).

Step:	Refer to:
1. Define the degrain cache location.	Project Settings (page 63) and Rendering Settings (page 68).
2. Analyse the grain profile of the input image.	Analysing the Frame (page 359).
3. Perform post-analysis cleanup.	Post-Analysis Clean-Up (page 363).
4. Cache the filtered images.	Caching the Result (page 364).
5. Apply input and secondary grading.	Primary Colour Grading (page 415) and Secondary Colour Grading (page 443).
6. (Optional) Analyse the grain profile of secondaries to degrain isolated parts of the image.	Removing Grain with Secondaries (page 366).
7. Render the result.	Rendering (page 591).

Analysing the Frame

Before processing the grain filter, the image must be analysed. Use the Grain Analysis panel to perform an analysis on a selected frame. The grain profile for the shot is recalculated each time an analysis is performed. If you navigate to a different frame in the shot and analyze it, the grain profile will be based on the new data.



NOTE It is recommended that you perform an analysis on the entire image, then analyse multiple regions of the image, if required.

To analyse the grain profile of an image:

- 1 Navigate to the frame you want to analyse.
- 2 Do one of the following:
 - If you want to degrain the entire image, click Degrain in the Image menu.
 - If you want to degrain a region of interest, click Degrain in the Colour menu.
- 3 (Optional) Enable the Sub-Region Analysis button and define an area to analyse. For best results, define multiple regions of uniform colour with no features. See [Working with Sub-Region Boxes](#) (page 361).
- 4 Click the Analyse button to determine the grain structure.

Viewing the Result

Degrain:applying a filterAfter the frame is analysed, you can view the result of applying the degrain filter on all or a portion (sub-region) of the image. For increased performance, it is recommended that you select the sub-region where you want to view the filtered result.



To apply the degrain filter:

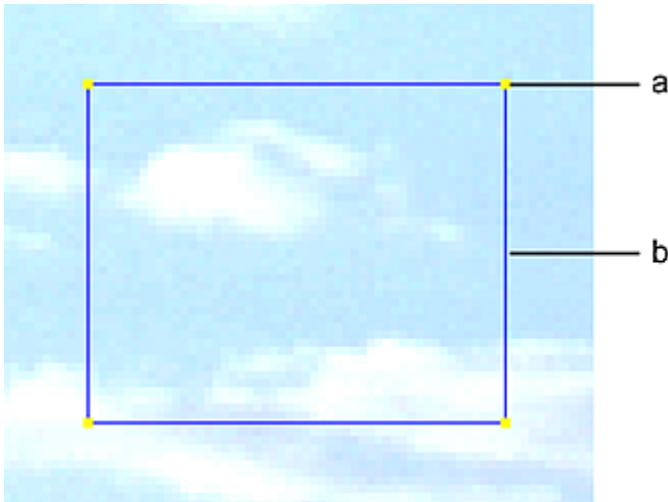
- 1 Navigate to the frame you want to view.
- 2 Do one of the following:
 - If you want to degrain the entire image, click Degrain in the Image menu.
 - If you want to degrain a region of interest, click Degrain in the Colour menu.
- 3 (Optional) Enable the Sub-Region Filtering button and drag to define an area to view with the result. See [Working with Sub-Region Boxes](#) (page 361).

NOTE Unlike sub-region analysis boxes, the sub-region filtering box cannot be deleted, only disabled.

- 4 Enable the Apply Degrain button to view the filter on the image.

Working with Sub-Region Boxes

Degrain:using sub-region boxes;boxes:adjusting for grain removalTo analyse specific regions of the image's grain structure, you need to use sub-region analysis boxes. If you are not satisfied with an analysis of the entire image, you can use sub-regions to constrain the analysis to focus on regions of interest. You will probably need to adjust the position or size of some boxes, or delete them. Following are basic procedures for working with boxes.



(a) Vertex (b) Border

To create a box:

- 1 Enable Sub-Region Analysis.
- 2 Hold down the left mouse button and drag the cursor diagonally on the image.
- 3 Release the mouse button.

To select a box:

- 1 Do one of the following:
 - Click inside the box.
The current box is active and all other sub-region analysis boxes are inactive.
 - Right-click inside the box to change its state, without affecting the state of other sub-region analysis boxes.

The vertices of active boxes are yellow (selected). The vertices of inactive boxes are red (disabled).

To move a box:

- 1 Click inside the box and drag it.

To re-size a box:

- 1 Click on a vertex and drag.

To display or hide boxes:

- 1 Press Z.

To delete one or more boxes:

NOTE The sub-region filtering box cannot be deleted, only disabled.

- 1 Do one of the following:
 - Press **Backspace** to delete all active boxes.
 - Using the Delete Boxes panel, do one of the following.

Click:	To delete:
Active	The currently selected box (highlighted in yellow).
Frame	All boxes on the current frame, whether active or not.
Shot	All boxes on all frames in the current shot.

Locating Sub-Region Analysis Boxes Within a Shot

Use the navigation buttons in the Reference panel to easily locate and navigate between shots that use sub-region boxes for de grain analysis.

To navigate between sub-region analysis boxes:

- 1 Click a button in the Reference panel.

Click:	To display:
	The first frame in the shot that has a sub-region box.
	The previous frame in the shot that has a sub-region box.
	The reference frame on which the most recent analysis was performed.
	The next frame in the shot that has a sub-region box.
	The last frame in the shot that has a sub-region box.

Post-Analysis Clean-Up

Once you have analysed the grain profile, you can make adjustments to the profile. You can adjust spatial degrain parameters, or apply a temporal degrain that can include previous or subsequent frames in the shot. A curve is displayed for each colour channel. You can manually adjust a response curve for the gain of each colour channel in the Curve Editor.

Adjusting Spatial Degrain Settings

Degrain:adjusting spatial settings;spatial Degrain settings Fine-tune grain removal by changing the spatial degrain parameters in the Degrain Settings panel. It contains:

Degrain Settings			
Red	1.000	Grain size	3
Green	1.000	Smoothing radius	3
Blue	1.000	Detail	0.00
Link		Opacity	100.0 %

Red Slider sets the gain for red channel colour values.

Green Slider ets the gain for green channel colour values.

Blue Slider ets the gain for blue channel colour values. For film scans, the grain is often greater in this channel.

Link Click to change gain values proportionally for all three colour channels.

Grain size Slider sets a value in pixels that is proportional to the size of the grain. The default value is 3, but may be higher for 4K images.

Smoothing radius Sets the blur radius. For smoother results, a higher value will add more pixels to the blur, but increase processing time.

Detail Slider sets the amount of detail to preserve when the Smoothing Radius is set to a high value. It is recommended you enter 0.05 to 0.15 as an initial value.

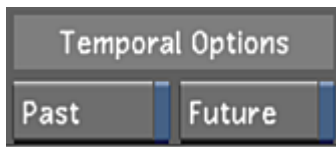
Opacity Slider sets the level of opacity between the source image and the output with the applied grain filter.

Applying Temporal Degrain Settings

Degrain:applying temporal settings;temporal Degrain settings If you degrain the source image (using the Degrain menu in the Input menu), you can include temporal degrain operations to the grain filter, by comparing the pixel data in past or future frames. These options yield best results when frames include many static or slowly moving objects in the image. Temporal options will improve grain removal results, but it will also increase processing time.

NOTE When temporal options are used on cached images, the result must be re-cached.

NOTE Incinerator does not process temporal degrain. Render to view these results.



To use temporal de grain, in the Temporal Options panel, enable one or both states:

- Past: include pixel data from previous frames in temporal processing.
- Future: include pixel data from subsequent frames in temporal processing.

Adjusting the Response Curves

Degrain:adjusting response curves;curves:adjusting de grainResponse curves represent the noise intensity for each colour channel. Modify the red, green, or blue response curves to fine-tune the de grain. You can add vertices to a curve to refine your adjustments.

To modify the red, green, or blue curve:

- 1 To display the response curve, click Show Curves.
- 2 Show the response curve you want to modify by clicking the button corresponding to the colour of the curve.
The selected curve is highlighted.
- 3 Sample the colour you want to use as a reference for your adjustments.
Red, green, and blue vertical lines representing the colour channels are plotted on the curve.
- 4 Do one of the following:
 - To add a vertex to the curve, place the mouse cursor over the area on the curve where you want to add the vertex and press A.
 - To lock the curve in place while adding a vertex, press `Shift+A` on the curve.
- 5 Click a vertex to display its tangent handle and then drag the handle to adjust the curve. You can also adjust the curve by dragging the vertex.
- 6 Modify the curve until you are satisfied with the results:
 - To select a vertex, click it. To select several vertices, draw a selection box around them.
 - To move one or several selected vertices, drag a selected vertex. To restrict vertex movement to the Y axis, press `Shift` while moving the mouse. To restrict vertex movement to the X axis, press `Shift+Alt` while moving the mouse.
 - To delete vertices, select them and then press D.

Caching the Result

Degrain:caching results;caching:degrained framesDegrain operations use caching of input images to manage the intensive processing requirements imposed on Lustre. If the Apply Degrain button is enabled, a degrained shot is automatically cached when the shot is initially played back after a Degrain operation. You can also use Lustre ShotReactor and Burn to cache frames. See [Caching Frames with Lustre ShotReactor or Burn](#) (page 365).

The Degrain menu does not have to be visible for Lustre to continue caching frames.

You can cache the filtered frames created using the CPU. Once cached, Lustre can recall cached frames during future playback in both CPU processing and GPU acceleration mode. See [GPU Acceleration](#) (page 400). (If any parameters are changed, GPU acceleration must be disabled and images must be reanalysed in CPU mode to update and re-cache the frames.)

When configuring your project in Lustre, you also define the location of cached frames using the project settings. Degrain frames can be cached in a sub-directory of the Scans folder or a user-defined de grain cache file location. See [Project Settings](#) (page 63) and [Rendering Settings](#) (page 68).

Only one instance of a frame can be cached in a shot, even if it is used in multiple cuts. If the cached media is saved as a preset, then you can load the cached media into the shot in a different cut. See [Saving and Loading Degrain Presets](#) (page 367).

Caching Frames from Wiretap

Wiretap: caching de grain frames You can cache frames from media imported from Wiretap and Wiretap Gateway. Cached frames are saved in the user-defined location set in the Degrain Cache field found in Project settings. Media is saved in this location even if, in the Rendering menu, the Degrain File Location option box is set to Save with Scan.

Media that is soft-imported from Wiretap use source files that can be accessed using a file path structure, rather than a Wiretap or Wiretap Gateway address. As a result, soft-imported frames can be saved in Scans Home or the user-defined de grain cache location.

Caching Frames with Lustre ShotReactor or Burn

Backburner: caching de grain frames; **Slave Rendering:** caching de grain frames ShotReactor (locally or remotely) can be used to cache frames in the background, or Burn (if installed) to submit a caching job. The ShotReactor server or Burn node must be mounted with NFS, UNC, or Samba.

To render de grain frames, disable Degrain Only. Graded frames with Degrain will be rendered in the Renders Full Home destination.

To do background caching using ShotReactor:

- 1 Display the ShotReactor menu. See [Rendering Shots as You Work](#) (page 607).
- 2 In the ShotReactor panel, toggle the On/Off button to On.
- 3 In the Degrain Only panel, toggle the On/Off button to On. When the Apply Degrain button is enabled in the Degrain menu, de grain frames are cached after you navigate to another shot.

To cache using a Burn node:

- 1 Display the Burn menu. See [Submitting a Remote Render Job](#) (page 611).
- 2 Enable the Degrain Only button.
- 3 Click Burn. When the Apply Degrain button is enabled in the Degrain menu, the de grain frames are cached.

Clearing the Cache

caching: removal of de grain frames You can clear the cached frames for the current shot or clear the *de grain_cache* folder for the entire cut. The files that will be removed are dependent upon where you choose to save your files.

When de grain cache frames are saved in the Scans directory, the cache for the current shot in the Scans directory can be cleared. When de grain cache frames are saved in a user-defined location, all files stored at that location will be removed.

To clear the cache for the current shot:

NOTE This operation only applies when de grain cache files are saved in the Scans directory.

- 1 In the Rendering menu of the project configuration settings, set the Degrain Cache File Location option box to Saved with Scan.
- 2 In the Image menu, click Degrain.
- 3 Navigate to the shot with the frames you want to clear.
- 4 Click Clear Cache.

To clear the cache for the project:

NOTE This operation only applies when de grain cache files are saved in a user-defined location.

WARNING Lustre will delete all files stored in the user-defined location. This includes all de grain frames stored in this location for the entire project, even if it includes files from a different scene. It is strongly recommended that you store cached frames for different projects separately. See [Configuring File Locations in Project Home](#) (page 59).

- 1 In the Rendering menu of the project configuration settings, set the Degrain Cache File Location option box to Saved with Degrain.
- 2 Do one of the following:
 - In the Image menu, click Degrain.
 - In the Project settings menu, click Rendering.
- 3 Click Clear Cache.

Removing Grain with Secondaries

Degrain:using secondaries;secondary colour grading:removing grainAfter you have applied de grain operations to the input image, you can isolate parts of the image to de grain using secondaries. Degrain operations are cumulative: after initial noise removal, multiple passes using secondaries on the same area will be added to the final result.

When applying a de grain filter to a secondary layer, you cannot use temporal options and cache de grain frames.

To de grain a secondary layer:

- 1 In the Colour menu, click Degrain.
- 2 Select a secondary layer. See [Secondary Colour Grading](#) (page 443).
- 3 (Optional) Add a geometry to constrain the area of de grain analysis and filtering.
- 4 Click Analyse.
- 5 To view results, click Apply Degrain.

Copying Degrain Information

Degrain:copying parameters using Selector;Selector:Degrain parametersYou can copy all or a selection of the Degrain menu parameters from a shot using the Selector. These parameters include the option to have de grain enabled or disabled on the destination shots. See [Copying Parameters with the Selector](#) (page 146).

Saving and Loading Degrain Presets

Degrain:saving and loading presets;presets:saving and loading for DegrainOnce you create a grain profile, you can save it as a preset and reload it for later use or in other shots. A preset saved for an input image can be loaded on a secondary, and vice versa.

See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

Repositioning Images

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Use the Reposition tools to reframe your shots. Generally, when you reframe a shot, you are adjusting the viewable area of your frames within a specified smaller area.

In a stereoscopic project, you may want to reposition images to realign shots for the Left Eye and Right Eye so that they converge correctly. See [Repositioning the Left Eye and Right Eye](#) (page 581).

NOTE Support for repositioning depends on the version of the graphics card installed on your system. See your release notes for details.

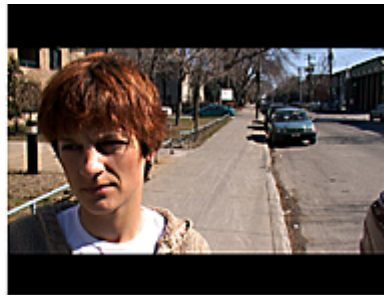
For example, if you are shooting in a widescreen film format and you intend to project the finished film on a television, you have to make certain decisions about how to deliver the content. You can scale and letterbox the film frames, or you can reposition the images in such a way that the important subjects of the scene are visible on screen (at the expense of “unimportant” elements).

If you shot your film in 35mm, but you want to show it in a widescreen format, you will need to crop the frames and adjust the racking—or the vertical positioning—of the image to modify the image's composition.

With letterbox images, you are scaling down a widescreen frame to fit horizontally on a television screen. This process adds black bars across the top and bottom of the screen and reduces the size of the images. However, letterboxing has the advantage of showing the entire image, thus remaining true to the vision of the artists. scaling:letterbox formatletterbox, scaling



a



b

(a) Original widescreen frame (b) Letterboxed frame

When you reposition frames, the actual source images are larger than the viewable area. To compensate, you make adjustments to the pan and scan of the frames to emphasize the key elements of a scene. For example, if the original frames show two people facing each other and talking, you may pan back and forth to see the person who is talking. The other person would then be partially or even completely off screen. cropped frames, repositioningrepositioning:cropped frames



(a) Original widescreen frame (b) Cropped and repositioned frame (c) Final frame

Use racking when you want to deliver your footage in a wider format than it was shot in. For example, when shooting on 35mm film, you may compose the scene so that the important elements of the image are contained in a narrow horizontal portion of the frame. In such a case, you set a cropping gate, and then adjust the vertical position (scan) of the shot in order to compose the scene as needed.



(a) Original 35mm with racking on (b) Cropped frame

Use the Reposition tools to animate the position, rotation, scaling, and aspect ratio of your shots. Do this, for example, to simulate camera movement, which is useful when you want to make a still shot more dynamic.

You can also use racking and repositioning in conjunction with tracking to stabilize shots with too much motion.

Finally, you can modify shot composition by flipping the shots vertically or flopping them horizontally.

TIP For real-time playback of repositioned shots, enable GPU processing by clicking the GPU button. See [GPU Acceleration](#) (page 400).

Adjusting the Frame Aspect Ratio

Before you begin repositioning your shots, make sure you have set the aspect ratio of the output frame.

You adjust the aspect ratio when your source material was shot in a format that differs from the intended delivery format, for example, if you shot in 35mm film (1.33 aspect ratio), but will deliver in a widescreen-format aspect ratio of 1.85. Or, you may have shot in a widescreen format at a 2.35 aspect ratio but intend to output a format for television (1.33 aspect ratio).

For information on adjusting the aspect ratio for a cut, see [Setting the Aspect Ratio](#) (page 117).

Accessing the Reposition Menu

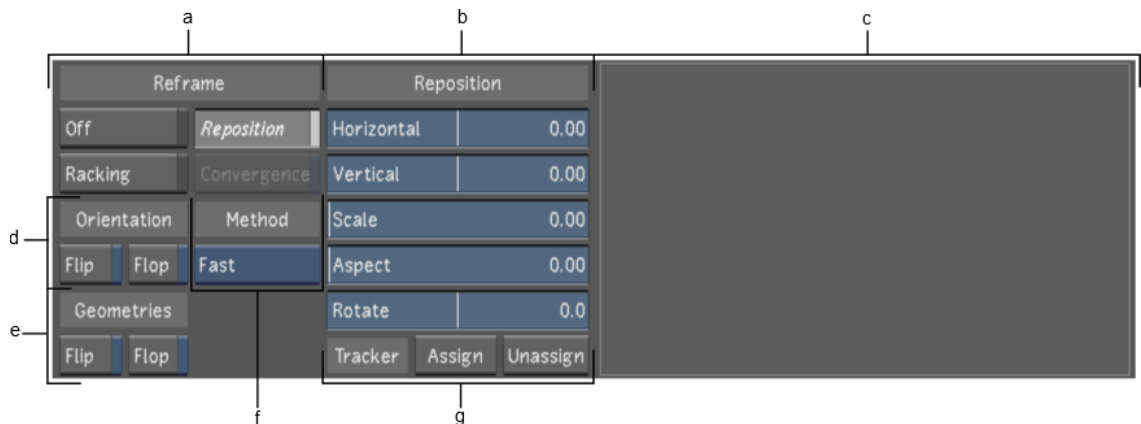
Once you select the shot you want to adjust or modify, you can access the Reposition menu. This menu provides the commands you need to reframe an image by:

- Repositioning
- Racking
- Changing the orientation
- Tracking a repositioned or racked shot

To access the Reposition menu:

- 1 Make sure you have set the aspect ratio to match the intended output format. See [Setting the Aspect Ratio](#) (page 117).
- 2 Select the shot to adjust.
- 3 Click Image, and then click the Reposition menu button.

The Reposition menu appears.



(a) Reframe panel (b) Reposition sliders (c) Preview window (d) Orientation panel (e) Geometries panel (f) Rendering Method box (g) Tracker Method panel

Reframe panel Enables a reframing tool to reposition, rack or converge an image. See [Reframing an Image](#) (page 372).

Reposition sliders Adjust the position of the shot by changing its vertical or horizontal position, rescaling, changing its aspect ratio, rotating or a combination of these repositioning options. See [Repositioning an Image](#) (page 372).

Preview window Displays the the relationship of the visible area (red rectangle) to the original image (blue rectangle). By default, the red reference rectangle is hidden by the blue one: they are equal in orientation and scale.

Orientation panel Displays the tools to apply a horizontal or vertical translation to the image. See [Flipping or Flopping a Shot](#) (page 374).

Geometries panel Displays the tools to apply a horizontal or vertical translation to the geometries associated to a secondary, independently of the orientation of the image. See [Flipping or Flopping a Shot](#) (page 374).

Rendering Method box Contains the rendering quality levels of the resulting repositioned image. See [Setting Rendering Quality](#) (page 378).

Tracker panel Controls whether point tracking is enabled or disabled for a repositions image. See [Tracking Repositioned Shots](#) (page 375).

Reframing an Image

Depending on how the original film was shot, you may have to reframe your footage at some point to account for the final aspect ratio of the delivery format. It may also be necessary to use the reframe functions to output film frames to common SD formats or DVD.

To adjust the reframing of an image, you can:

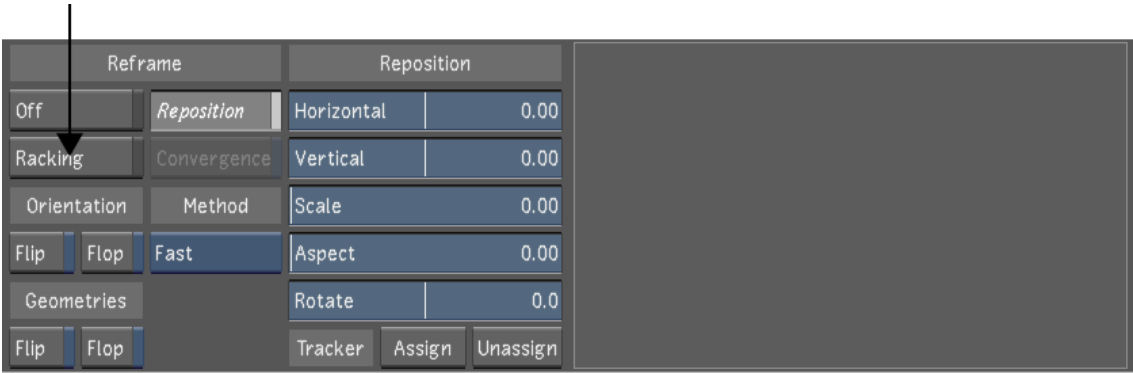
- Use racking to adjust vertical position only.
- Use repositioning to zoom and adjust the position.
- In a stereoscopic project, use convergence to reposition a shot in the assigned eye and apply the equal and opposite repositioning operation to the other eye. See [Repositioning the Left Eye and Right Eye](#) (page 581).

Racking an Image

reframing:racking the imageracking, to reframe footageRacking involves adjusting the vertical position of a shot. You need to rack your images after you adjust the aspect ratio. By racking, you ensure that the important element of the shot composition is framed correctly in the final images.

To adjust the racking of an image:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Enable Racking.



- 3 Use the Vertical slider to adjust the vertical position of the image.
- 4 You can animate the vertical position using the Animation controls. See [Animating Reposition Values](#) (page 376).

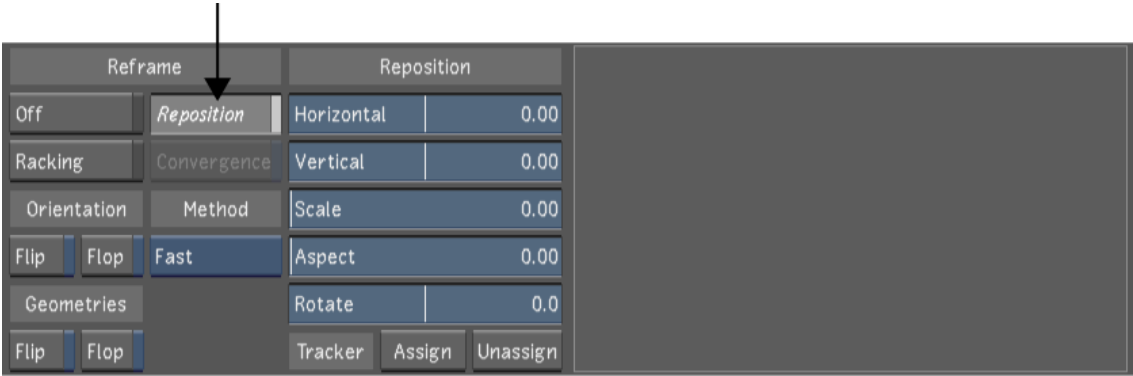
Repositioning an Image

reframing:using reposition controlsrepositioning:after adjusting the project aspect ratioRepositioning involves scaling, rotating, and horizontally and vertically moving images to ensure that the correct elements are visible in the frame. You need to do this after adjusting the project aspect ratio. If you do not, key elements of the shot composition may be cropped or even completely off screen.

You can zoom into the image and offset the position in the horizontal and vertical directions.

To reposition an image:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Enable Reposition.



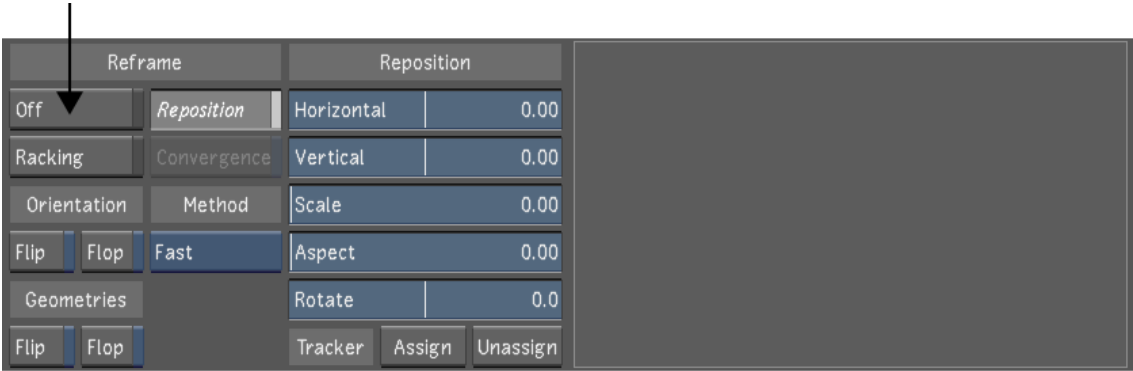
- 3 In the Reposition panel, use the sliders to adjust the image scale and positioning as needed.
- 4 You can animate Reposition parameters using the Animation controls. See [Animating Reposition Values](#) (page 376).

Turning Off Reframing

disabling:reframing settingsreframing:disabling settingsYou can remove Reframing settings from your shots at any time.

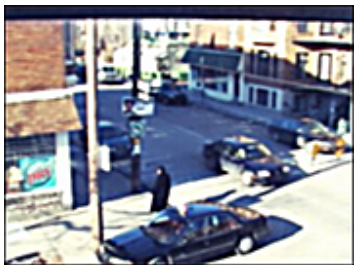
To turn off reframing:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Enable Off.



Flipping or Flopping a Shot

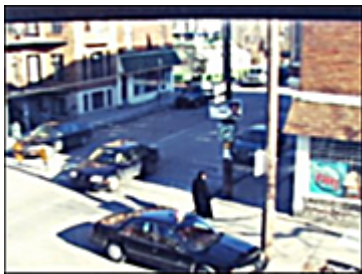
reframing:flipping and flopping shotsflopping, shotsflipping, shotsUse the Flip or Flop tool to change your shot's orientation.



Original Image



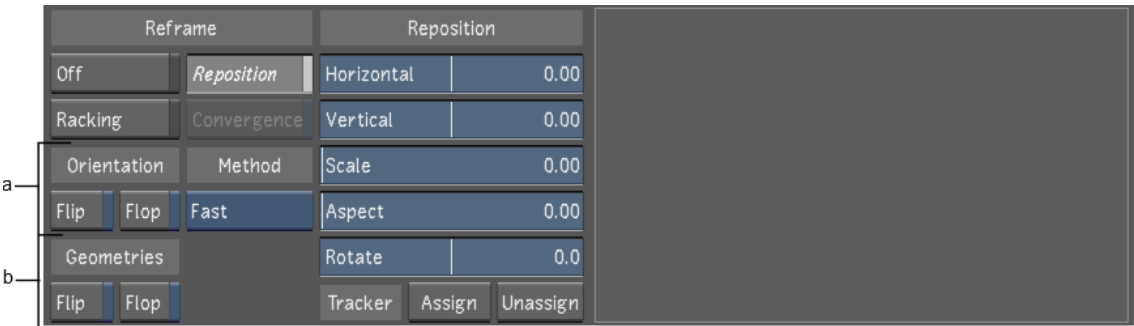
Flipped image



Flopped image

To change the orientation of a shot:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Enable one or both orientation tools.



(a) Orientation tools (b) Geometries tools

Enable:	To:
Flip	Apply a horizontal translation to the image.
Flop	Apply a vertical translation to the image.

If you have geometries associated to secondaries, you can apply a horizontal or vertical translation to the geometries, independently of the image's orientation, using the Geometries tools. By default, the geometries will follow the image's orientation.

Enable:	To:
Flip	Apply a horizontal translation to the geometries.
Flop	Apply a vertical translation to the geometries.

NOTE When applying a flip or a flop to Stereo3D content from inverted camera rigs, it is important to also enable to corresponding Geometries Flip / Flop to avoid issue when drawing shapes in Sync mode. Flipped or flopped Stereo3D content should always have the same Geometry orientation, regardless of whether or not there are geometries in the shot to avoid issues if you add geometries to the shot later.

Tracking Repositioned Shots

repositioning;with the trackertracking:repositioned shotsUse the Point Tracker to stabilize a repositioned shot so that a selected point or shape in the source frame remains fixed in the same spot in the Player. You can use the Point Tracker in conjunction with reframing to stabilize jittery shots, or to automate the repositioning process. For example, if the original widescreen shot contains a pan across a landscape, but you want to fix the view on a house (for television viewing), you track the house, and then assign the tracking data to the Reposition tool. This sets pan and scan values at each frame. The result is that the house remains in the same spot in the repositioned image.

NOTE You can use exported stabilizer data from other Autodesk applications to stabilize your shots. See [Loading Tracker and Stabilizer Data from Autodesk Applications](#) (page 515).

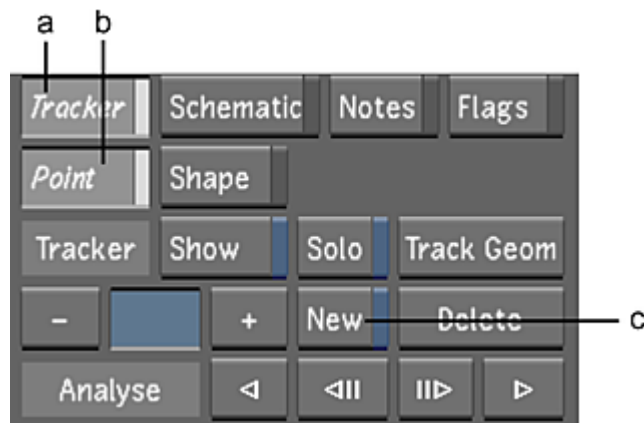
This section is intended to provide an overview of the stabilizing process. See [Animating the Point Tracker](#) (page 506).

Using the Point Tracker

You can use the Point Tracker to stabilize a repositioned shot.

To assign tracking information to the pan and scan settings of an image:

- 1 Make sure the aspect ratio value is set up as needed. See [Setting the Aspect Ratio](#) (page 117).
- 2 Select the shot to track.
- 3 Click Colour, and then click Secondaries to display the Secondaries menu.
- 4 Select the tracking feature by clicking Tracker.
- 5 Select the Point Tracker by clicking Point.
- 6 Enable a new tracker by clicking New.



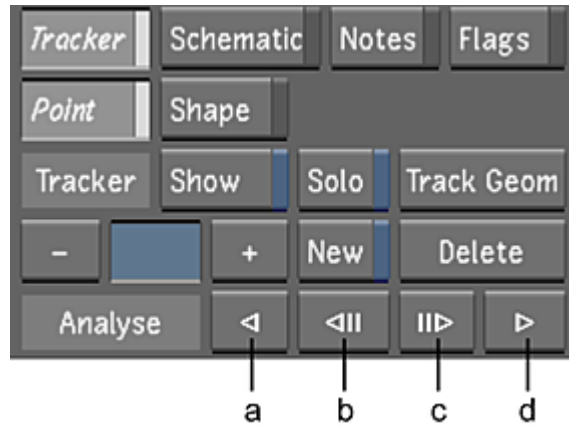
(a) Tracker button (b) Point button (c) New button

- 7 Click the tracking point in the image.
- 8 Click Image, and then click Reposition to display the Reposition menu.

A tracking box appears. You can adjust the box as needed to improve the track.

- 9 Click one of the Analyse buttons to begin the tracking process.

The system tracks the tracking point. After tracking is complete, you may need to make slight adjustments to the tracking data. See [Animating the Point Tracker](#) (page 506).



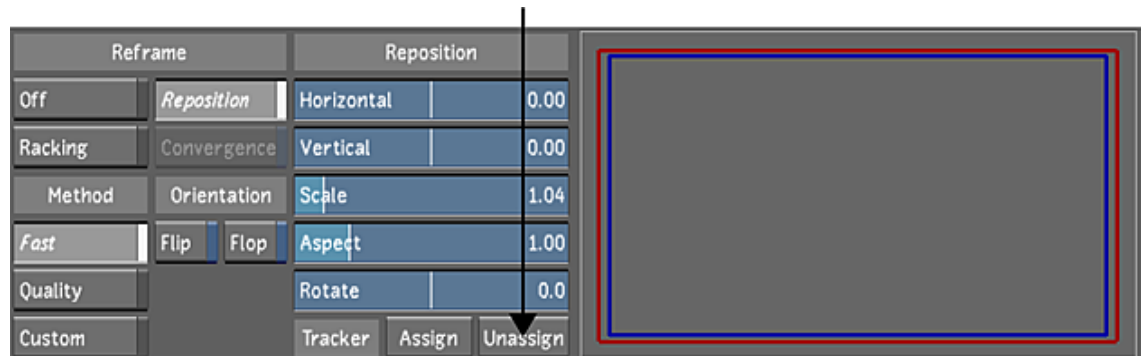
(a) Analyse backwards (b) Analyse back one frame (c) Analyse ahead one frame (d) Analyse forward

- 10 Enable either Racking or Reposition.
- 11 If you enabled Reposition, scale the image as needed.
- 12 Click Assign to apply the tracking data to the shot.

If you enabled Racking, the tracking point remains fixed vertically. If you enabled Reposition, the tracking point remains fixed both horizontally and vertically.

To turn off tracking data for a shot:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Click Unassign.

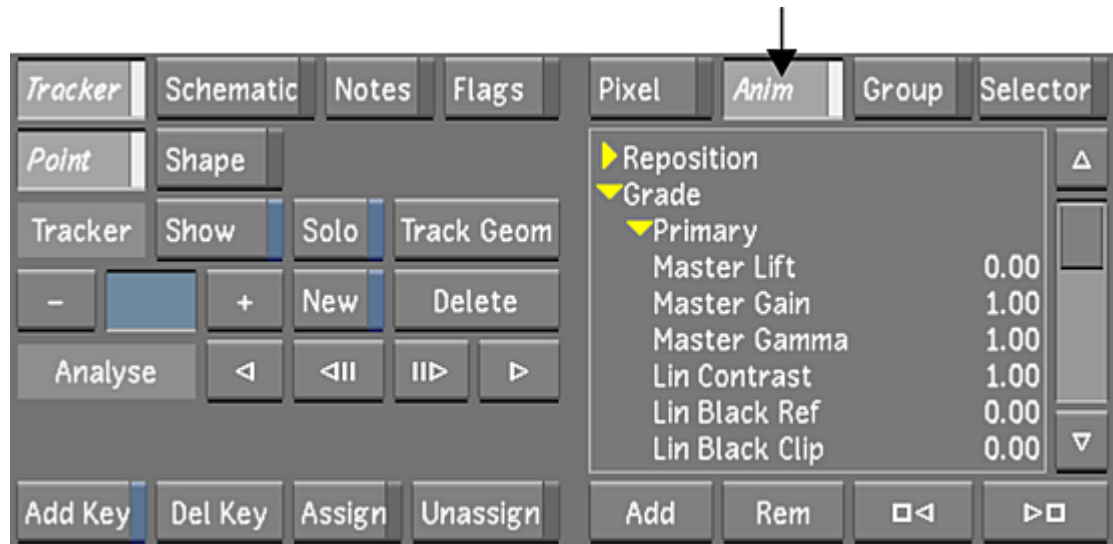


Animating Reposition Values

repositioning;using animation controlsanimating;reposition valuesUse the Animation controls in conjunction with the Reposition tools to animate the position, rotation, scaling, and aspect ratio of your shots. You can use this feature to simulate camera movement, which is useful when you want to make a still shot more dynamic. You can animate manually or using Autokey.

To animate reposition values manually:

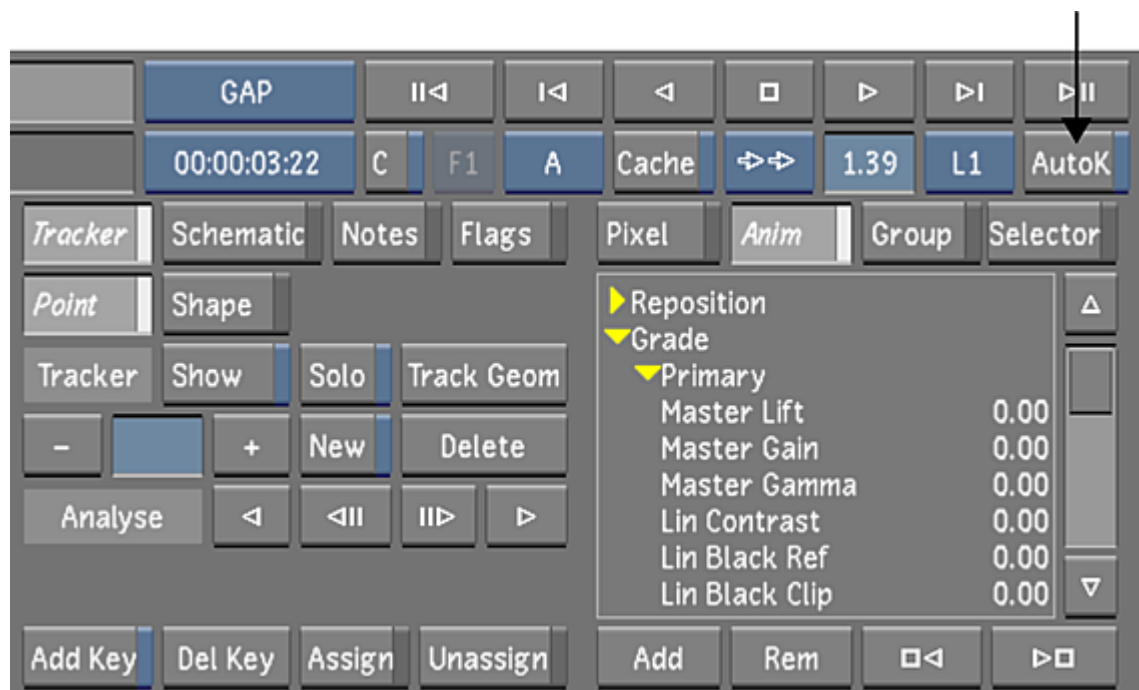
- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Enable Racking or Reposition.
- 3 Click Anim to display the Animation controls.



- 4 In the channel hierarchy, select the Reposition directory.
- 5 Move to the first frame of the shot, click Add to add a keyframe, and then adjust either the rotation, scaling, aspect ratio, horizontal or vertical position as needed.
- 6 Move to the last frame of the animation.
- 7 Set the reposition values and then click Add.
Keyframes are added to the selected channels. The values in between the keyframes are interpolated using Bezier interpolation.
- 8 Scrub to view the animation.
- 9 To modify the animation curve, use the tools in the Animation menu. See [Accessing the Channel Editor](#) (page 541).

To animate position and scaling with Autokey:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 Enable Racking or Reposition.
- 3 Enable AutoK (Autokey).



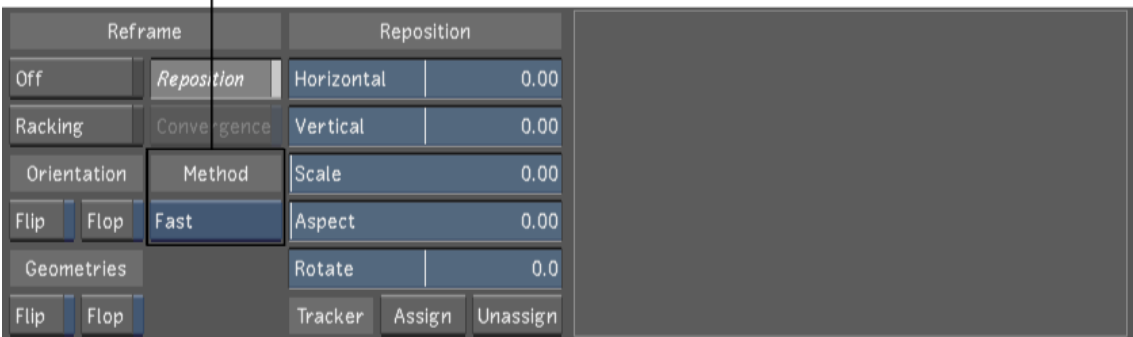
- 4 Move to the first frame of the shot and then adjust the scaling or the positioning as needed. Keyframes are automatically added at the current frame to the channel parameter you change.
- 5 Move to the last frame of the animation.
- 6 Set the scaling and the position. Keyframes are added to the adjusted channels. The values in between the keyframes are interpolated using Bezier interpolation.
- 7 Scrub to view the animation.
- 8 To modify the animation curve, use the tools in the Animation menu. See [Accessing the Channel Editor](#) (page 541).

Setting Rendering Quality

repositioning:setting rendering quality afterrendering:setting quality for repositioned shotsThere are several options you can use to modify the way the repositioned images are rendered.

To set reposition rendering quality:

- 1 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 2 From the Rendering Method box, select a rendering method.



Enable:	To:
Fast	Use bilinear rendering. This gives fast display at a lower quality. Generally, you should work in Fast mode.
Quality	Use bicubic rendering. This gives higher quality but requires longer to display the frames. Use this option during MemCache rendering to show exactly how the image scaling will be performed in the final render.
Custom	Use the highest rendering quality. You should use this when performing the final render. This is the default method. It uses a Lanczos resize filter.

NOTE In Real-Time Deliverable mode, you can select additional custom filters. See [Creating Real-Time Deliverables from the Timeline or Rendered Material](#) (page 673).

Input LUTs

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Images originating from different media and devices, such as digital cameras or scanned film, have different colour characteristics. On import, you can apply an Input LUT to convert them all to the grading working space prior to the grading process. Unlike LUTs applied for viewing, Input LUTs change the underlying colour values of the pixels.

NOTE If you are working media imported using the Wiretap Gateway, you can use the Transcode LUT options instead of an Input LUT. The Transcode LUT options allow you to apply colour transforms based on the Academy/ASC XML colour transform format as well as 3D LUTs and Flame-compatible 1D LUTs, which provides a great amount of flexibility. See [Transcode LUT Options Settings](#) (page 223).

If running the Windows version of Lustre, save print LUTs in the *C:\Program Files\Autodesk\Lustre <version_number>\lut* folder. If running the Linux version of Lustre, save print LUTs in the */usr/autodesk/lustre_<version_number>/lut* directory. Lustre provides industry-standard 3D LUTs which are located in *C:\Program Files\Autodesk\Lustre Color <version_number>* in the Windows version and */opt/Autodesk/Lustre_Color* in the Linux version.

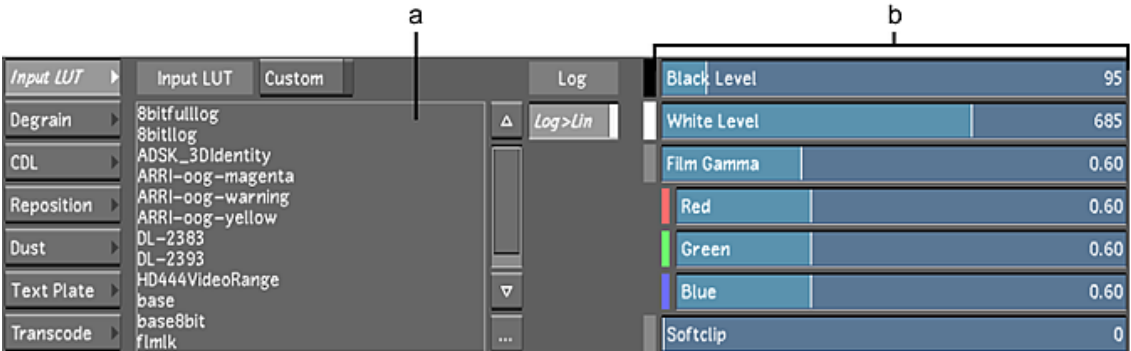
Accessing the Input LUT Menu

Use the Input LUT menu to apply existing input LUTs to shots. In Linear mode, you can also use the LUT Editor to create Log to Lin conversion LUTs for shots containing logarithmic data.

To access the Input LUT menu:

- 1 In the Main menu, click Image.
- 2 Click Input LUT.

The Input LUT menu appears. Both 1D LUTs and 3D LUTs are listed in the Input LUT list.



(a) Input LUT list (b) LUT Editor (Linear mode)

Importing a LUT File

input LUTs: importing Lustre can use the LUT files that you import into the application folder's *lut* directory. The LUT filename is displayed when the LUT list is displayed.

There are two ways to import LUTs into Lustre:

- Outside of Lustre, files can be copied manually to the application *lut* folder. If running the Windows version of Lustre, save print LUTs in the *C:\Program Files\Autodesk\Lustre<version>\lut* folder. If running the Linux version of Lustre, save print LUTs in the */usr/Autodesk/lustre_<version>/lut* directory.
- Within Lustre, copies of LUT files are imported using the Import file browser.

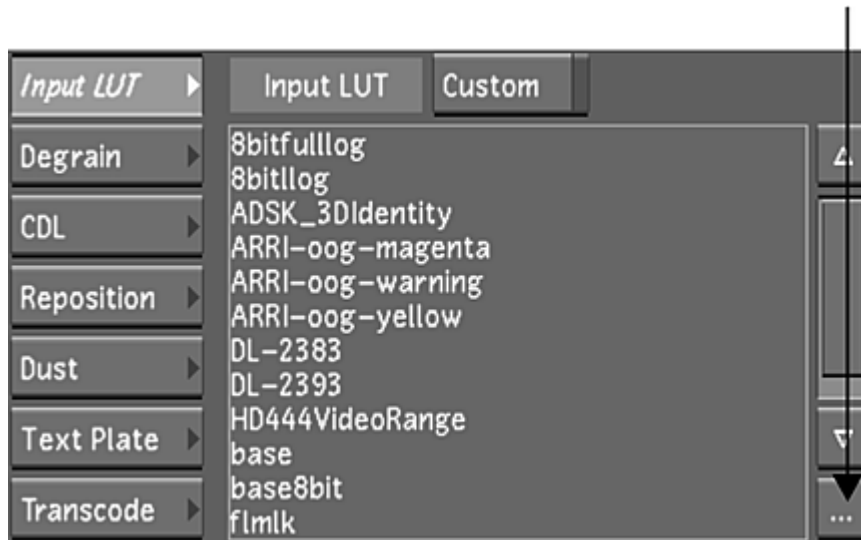
TIP Lustre provides industry-standard 3D LUTs which are located in *C:\Program Files\Autodesk\Lustre Color <version>\3D LUTs* in the Windows version and */opt/Autodesk/Lustre_Color* in the Linux version.

NOTE 1D LUTs, 3D LUTs and floating conversion LUTs must have the naming convention, *<name.lut>*, *<name.3dl>*, and *<name.fclut>*, respectively, or they will not appear in the LUT list.

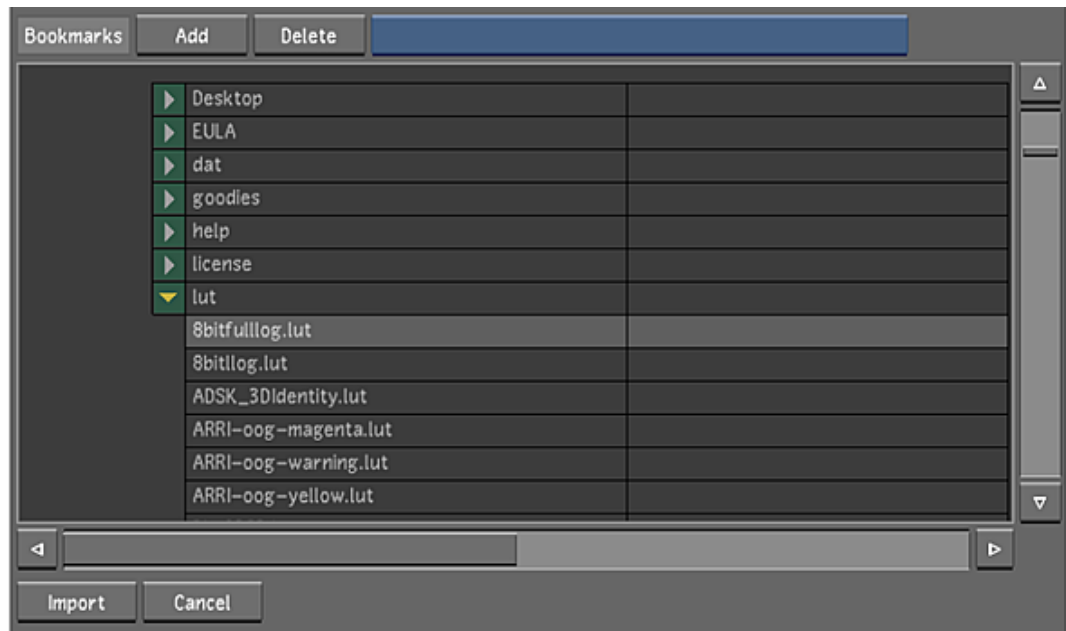
All LUT lists contain 1D and 3D LUTs, except the Float Conversion LUT list. Files with the *.fclut* extension can be imported to the Float Conversion LUT list are exclusive to that list. See [Calibration Settings](#) (page 65).

To import a file while in Lustre:

- 1 Open the Input LUT menu. See [Accessing the Input LUT Menu](#) (page 381).
- 2 In the LUT List, click the Browse button.



The Import file browser appears.



- 3 Navigate to the appropriate source folder and select one or more LUT files (You can also use [bookmarks](#) (page 210) to retain a list of folder locations). Traditional methods of multi-selecting (Shift-click, Ctrl-click) are enabled.
- 4 Click Import.

WARNING If a LUT with the same filename is already in the LUT list, the Import button will turn red. You must click again to confirm that you want to overwrite the file.

TIP If no files are selected, you can also press `Enter` to cancel LUT file selection and close the Import file browser.

A copy of the LUT file is imported into the *lut* folder, and appears in the LUT list.

Applying an Existing Input LUT

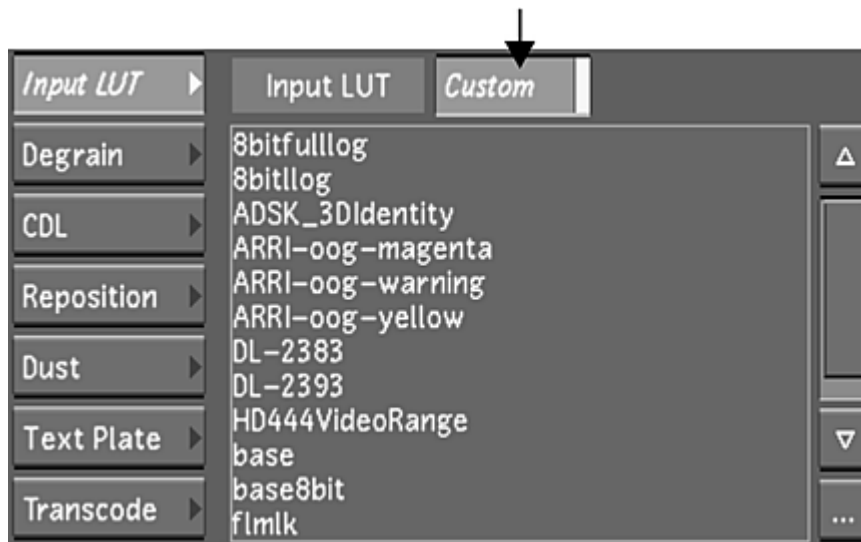
converting;data with input LUTsinput LUTs:applying existingAn input LUT can be used to convert and gamma correct the logarithmic or linear data. Apply an input LUT to a shot to remap the colour values. Input LUTs are applied on a shot-by-shot basis and can be toggled on and off.

The settings in the Input LUT menu are saved in grade files. This applies to both 1D LUTs and 3D LUTs. When you use a grade from another station that contains an input LUT that does not exist on your station, the input LUT will appear in the Input LUT list, under Extra LUT from Grade. You can apply this LUT to other shots in the timeline.

NOTE When a LUT is imported into Lustre, it is automatically embedded in the grade file and can therefore be rendered on remote rendering systems without the original LUT file being present.

To apply an existing input LUT:

- 1 Select a shot in the Storyboard to which you want to apply an input LUT.
- 2 In the Input LUT menu, select either a 1D input LUT or a 3D input LUT from the Input LUT list and then enable Custom.

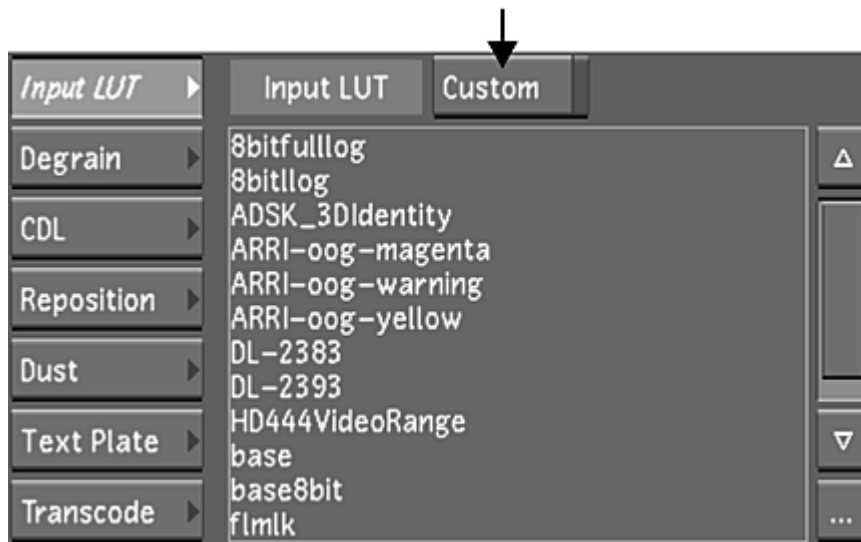


The input LUT is applied to the current shot.

- 3 To select a LUT originating from another station, expand Extra LUT from Grade in the Input LUT list, and then select the LUT.

To turn off an applied input LUT:

- 1 Select a shot in the Storyboard with an input LUT.
- 2 In the Input LUT menu, disable Custom.

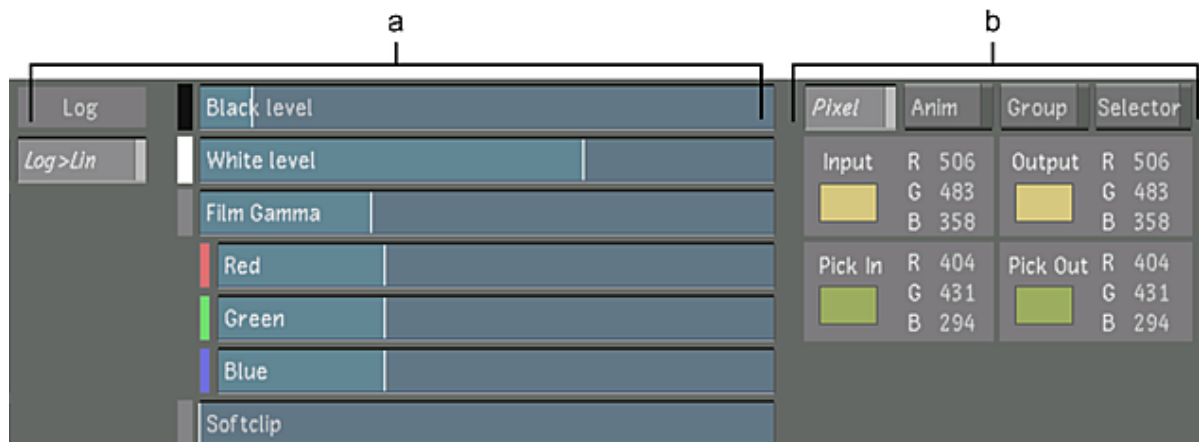


The input LUT is no longer applied to the shot.

- 3 Click the input LUT in the input LUT list to remove it completely. The input LUT is deselected.

Linear Mode: Creating Conversion LUTs

converting:from logarithmic to linearinput LUTs:creating conversion LUTs Different film stocks produce various results. Shots can also occur under many conditions, creating colour variations in the image. To create continuity between shots, you can apply unique Log to Lin conversion LUTs to different shots. Use the LUT Editor to create Log to Lin conversion LUTs. Conversion LUTs are used to gamma correct the shot and convert logarithmic data to linear data.



(a) LUT Editor (b) Pixel Analyser

To create a Log to Lin conversion LUT, the following steps are usually involved:

- 1 Set up the Player to monitor the shot you are converting and a reference image.
- 2 Use the Pixel Analyser to sample corresponding colours from the original and converted shot, as well as a reference image.
- 3 Modify the default conversion settings using the LUT Editor.

Viewing Reference Images

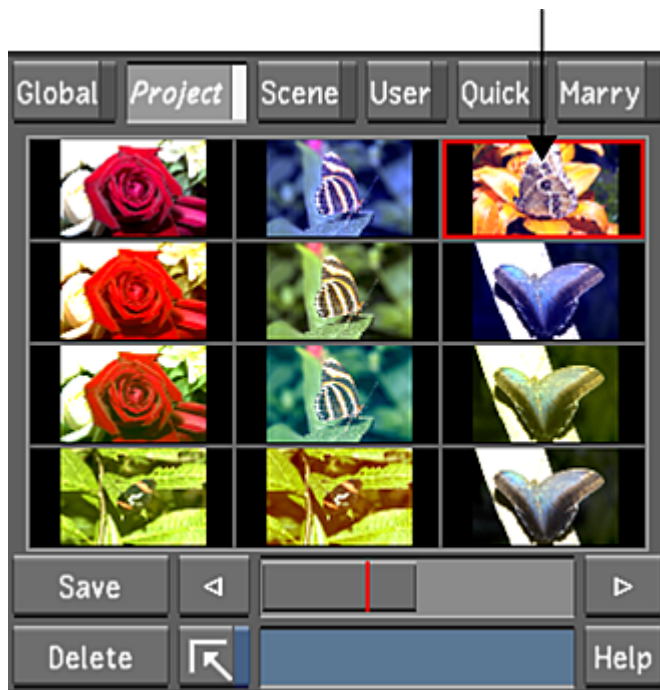
reference images:viewing results of logarithmic to linear conversioninput LUTs:viewing reference imagesWhile creating Log to Lin conversion LUTs, it is important to view reference images. For example, view other shots in the cut to ensure continuity.

You can also view a frame from the shot you are working on to see how it looked on film. To do so, save a reference image to a Grade bin in Log mode, and then load it to the frame buffer in Linear mode. For information on saving shots to a Grade bin, see [Using Grade Bins](#) (page 151).

When you view reference images, you can switch between the reference image and the current shot, or you can view them both simultaneously.

To switch between a reference image and the shot you are working on:

- 1 Load the reference image to the frame buffer by doing one of the following:
 - Go to the frame you want to use in the Storyboard and then press **⌘** to load it to the frame buffer.
 - Right-click a Grade bin thumbnail.



- 2 In the Storyboard, select the shot you are working on.
The shot appears in the Player.
- 3 To toggle between the reference image and the shot you are working on, press **L**.

To display the reference image and the current shot simultaneously:

- 1 Assign the shot you want to work on to Playhead A. Press **F1** or select A from the Playhead button, and then select the shot in the Storyboard.



- 2 Press **F2** or select B from the Playhead button.
The shot assigned to Playhead B appears.
- 3 Load the reference image to the frame buffer by doing one of the following:
 - Press **K** to load the current frame in the Storyboard to the frame buffer.
 - Right-click a Grade bin thumbnail.
- 4 Press **L** or click S to assign the reference image to Playhead B.



The reference image appears in the Player. At any time, press **L** to toggle between the original shot (**O** button) assigned to Playhead B and the reference image (**S** button).

TIP If you want to use a shot from the Storyboard for reference, you can use the shot assigned to Playhead B. In this case, you do not need to load a reference image to the frame buffer.

- 5 Press **F4** to enable Dual View.



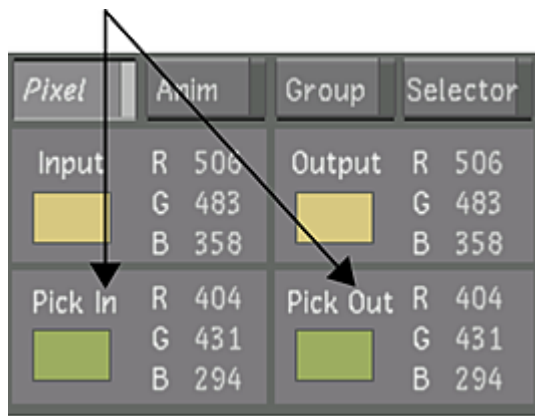
- 6 Press **F4** until you display Horizontal Wipe or Vertical Wipe mode.
The images assigned to Playhead A and Playhead B are displayed. Playhead A is currently selected and displays the shot you are working on. Playhead B displays the reference image.
TIP Press **F4** until you are in 2-up node to view your reference image (Playhead B) and the shot you are working on (Playhead A) in separate viewers.
- 7 To work on the shot you assigned to Playhead A, press **F1** or select A from the Playhead button.
The shot you are working on is selected. You can move back and forth between the shots in Playhead A and Playhead B by pressing **F1** and **F2** respectively.

Comparing Colour Values

colours:comparing when creating conversion LUTsinput LUTs:comparing colour valuesWhile creating the Log to Lin conversion LUT, you can use the Pixel Analyser to sample the shot and compare the original and resulting colour values.

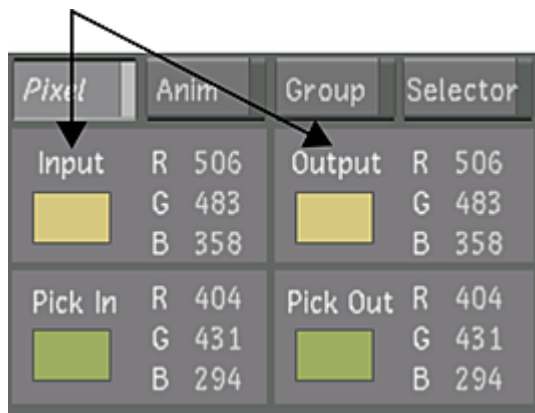
To compare colour values:

- 1 Click a pixel in the image.
Both the original (Pick In) and modified (Pick Out) colours are displayed simultaneously in the lower section of the Pixel Analyser. The RGB values for the selected pixel are also displayed.



- 2 Compare the colours in your shot to a set of reference values. View the reference image, and then place the mouse cursor over a pixel in the image without clicking it.

The original (Input) and modified (Output) colours in the reference image are displayed simultaneously in the upper section of the Pixel Analyser. If you click the reference image, the reference values will overwrite the previously sampled values.



Modifying Default LUT Values

When you convert logarithmic data to linear data with the Log to Lin conversion LUT, you can modify several settings from the Input LUT menu:

- The reference white and reference black levels
- The gamma of the incoming film footage
- The softclip value—the degree to which the shoulder of the upper end of the conversion curves is softened

Modifying Reference White and Reference Black Levels

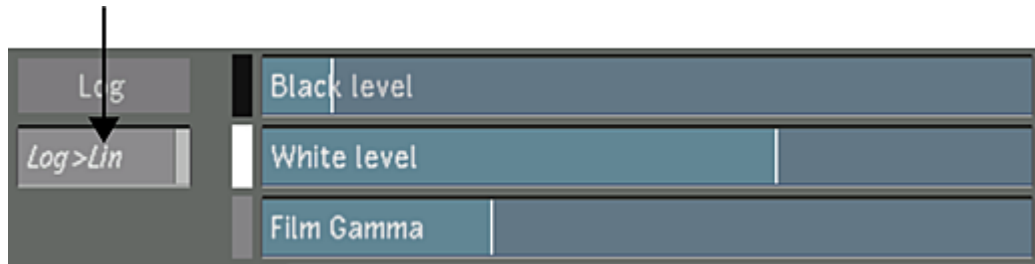
input LUTs:modifying reference black and white levelsblack level:modifying for input LUTswhite level, modifying for input LUTsReference white and reference black levels define the source white and black range. By default, reference white is set to 685 and reference black is set to 95. Using these values (which correspond with typical Kodak film stock results):

- All incoming pixels with values between 685 and 1023 produce white pixels.
- All incoming pixels with values between 1 and 95 produce black pixels.

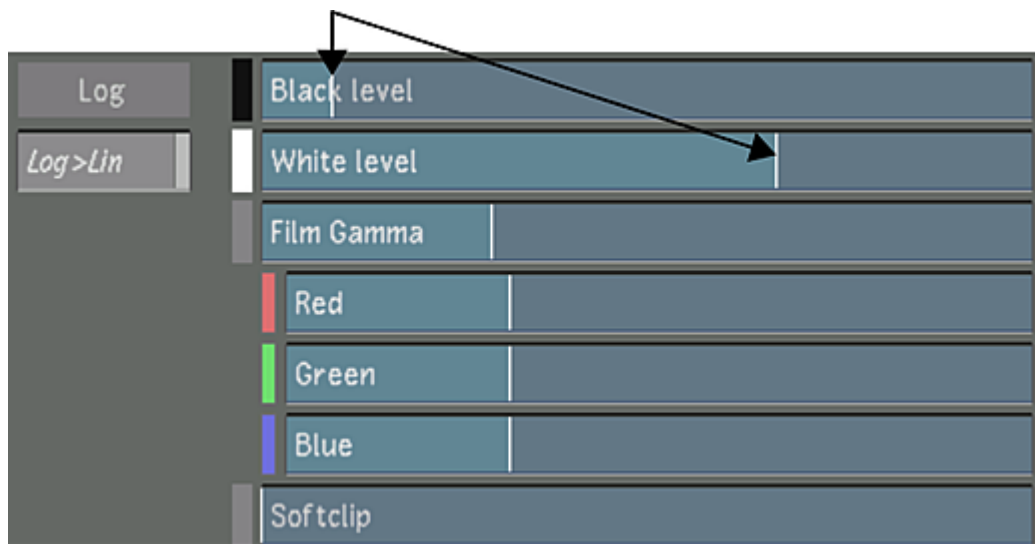
You can modify the reference white and reference black levels for the red, green, and blue channels proportionally or independently.

To modify reference white or black levels:

- 1 In the Input LUT menu, enable the Log>Lin button.



- 2 To modify the red, green, and blue channels in the reference white or black levels proportionally, drag the White Level or Black Level slider.



While dragging, the reference white or black level is displayed in the slider.

- 3 To modify the red, green, and blue channels for the reference white or black levels independently, click the White Level tab or Black Level tab to expand the parameter, and then drag the Red, Green, or Blue slider.



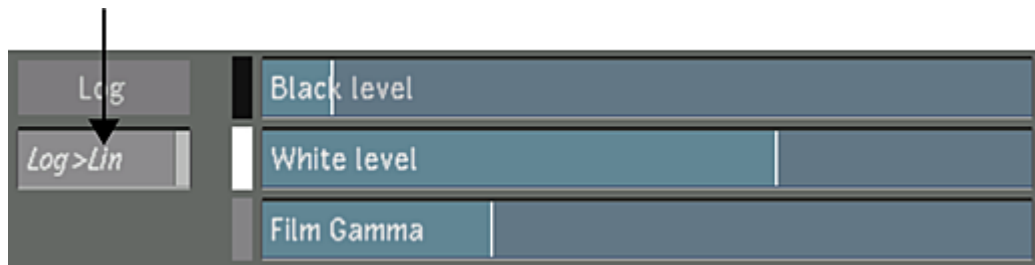
While dragging, the reference white or black level of the selected channel is displayed in the slider.

Modifying the Gamma of the Incoming Film Footage

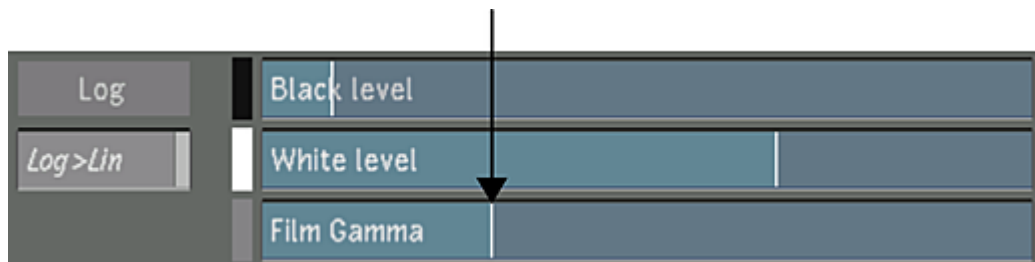
input LUTs:modifying gamma of film footagegamma:modifying for input LUTsTypically, the gamma of a film negative is 0.6. Only adjust this value if your film negative is of a non-standard gamma. You should not have to modify this value by very much. The Film Gamma values affect the gamma correction curve inversely.

To modify the gamma correction curve:

- 1 In the Input LUT menu, enable the Log>Lin button.

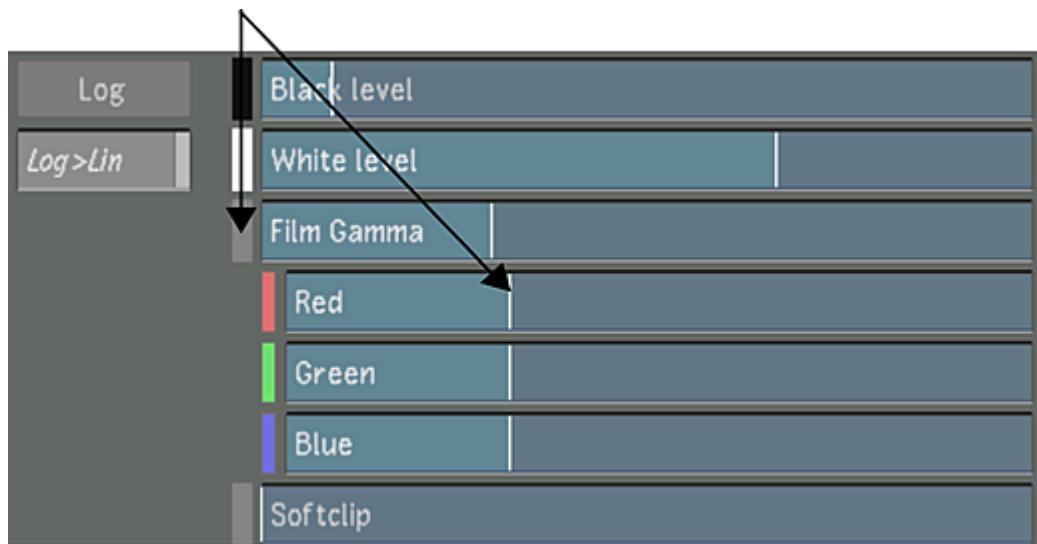


- 2 To modify the red, green, and blue channels for the film gamma levels proportionally, drag the Film Gamma slider.



While dragging, the film gamma level is displayed in the slider.

- 3 To modify the red, green, and blue channels for the film gamma independently, click the Film Gamma tab and then drag the Red, Green, or Blue slider.



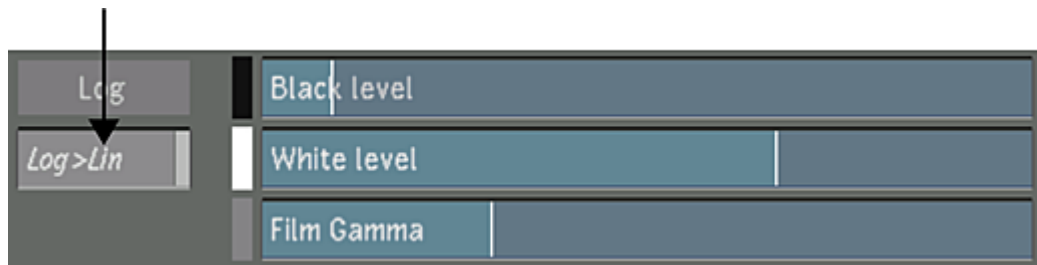
While dragging, the film gamma level for the selected channel is displayed in the slider.

Adjusting Softclip Values

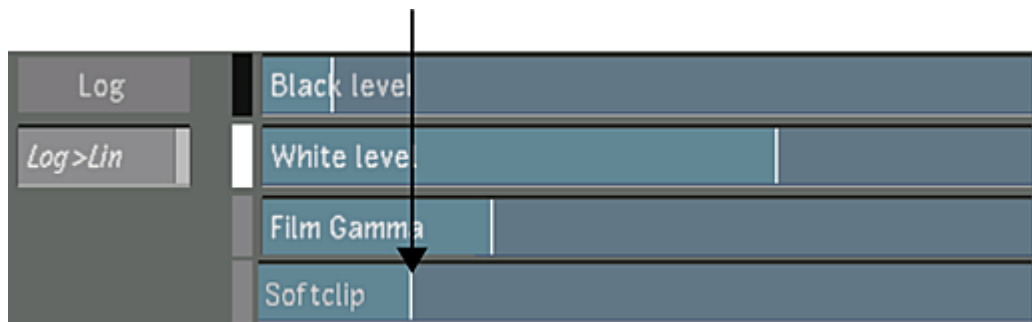
input LUTs:modifying reference soft clip valuessoftclip values, modifying for input LUTsYou can soften the shoulder of the gamma correction curve by adjusting the softclip levels. When you soften the shoulder of the conversion curve, you soften the transition of colours toward the reference white value. This results in softer highlights in your shot.

To soften the shoulder of the gamma correction curve:

- 1 In the Input LUT menu, enable the Log>Lin button.

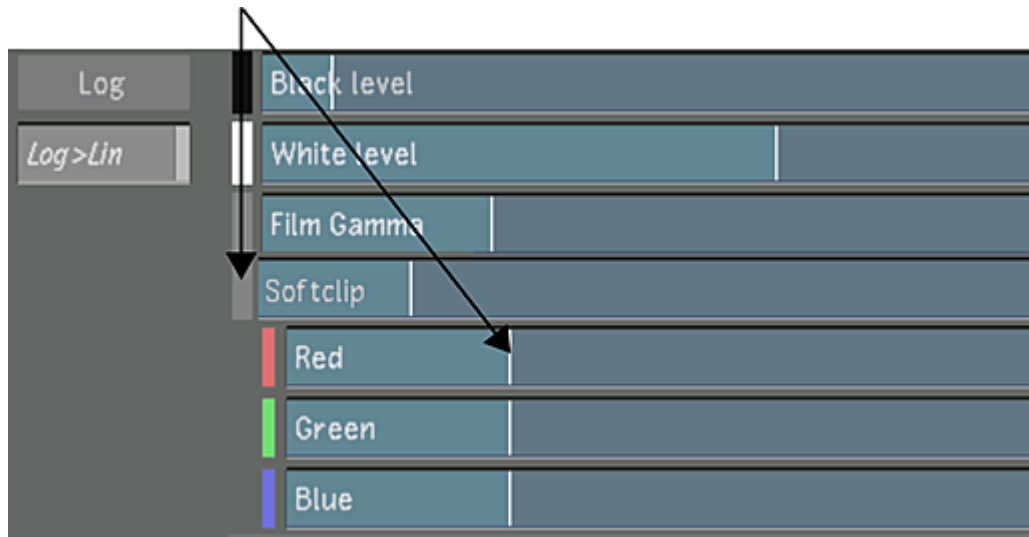


- 2 To modify the red, green, and blue channels for the softclip levels proportionally, drag the Softclip slider.



While dragging, the softclip level is displayed in the slider.

- 3 To modify the red, green, and blue channels for the softclip levels independently, click the Softclip tab and then drag the Red, Green, or Blue slider.



While dragging, the softclip level for the selected channel is displayed in the slider.

Working with Half Float Media

OpenEXR is a high-dynamic range (HDR) media format supporting multi-resolutions and an arbitrary number of channels and channel types, such as specular, diffuse, alpha, RGB, normals, in a single file. Lustre supports OpenEXR 16-bit RGB only (files with other channels cannot be read). This format is sometimes referred to as "16-bit half float".

Lustre can obtain 16-bit floating-point media in four distinct ways. First, it can acquire the media by way of a Wiretap server. That is to say, by browsing the clip libraries and associated framestores of Visual Effects and Editing applications. Second, it can acquire the media directly, by importing OpenEXR media using a Wiretap Gateway server. Third, OpenEXR files can be read directly without using the Wiretap Gateway server. Fourth, media shot with a RED camera in HDRx mode and where "High Dynamic Range" is selected in the HDRx settings section of the Transcode tab also enter Lustre as 16-bit floating-point. In all cases, you need to tell Lustre how to work with the half float media.

As indicated, OpenEXR represents pixels as floating-point numbers. Internally, Lustre uses a 16-bit integer buffer format (although processing is done in floating-point). Thus, before you can grade OpenEXR media, it must be converted from floating-point to Lustre's special extended-range integer format. This is done by setting a floating-point conversion LUT for the project. This setting is located in the calibration tab of the project settings. Several floating point conversion LUTs are provided as examples.

LUT	Description
log_default_v2	Converts scene-linear floating-point media into an extended range logarithmic space suitable for grading using Lustre's logarithmic grading controls. Unlike log_default, log_default_v2 avoids problems with lifted blacks when using ACES colour transforms in Setup > Calibrate. This is the default float conversion LUT, and is the recommended way of grading HDR media.

LUT	Description
log_default	Converts scene-linear floating-point media into an extended range logarithmic space suitable for grading using Lustre's logarithmic grading controls.
log_black_limit1	Similar to log_default, but accomodates media from some digital cameras which may have spurious negative or very low values.
lin_default_v2	Converts the scene-linear floating-point media into an extended range video space suitable for grading using Lustre's linear grading controls. Unlike lin_default, lin_default_v2 avoids problems with lifted blacks when using ACES colour transforms in Setup > Calibrate.
lin_default	Converts the scene-linear floating-point media into an extended range video space suitable for grading using Lustre's linear grading controls.
lin_black_limit1	Similar to lin_default, but accomodates media from some digital cameras which may have spurious negative or very low values.
ACESproxy_CDL_workflow	Similar to log_default, but the range of scene exposures presented to the ASC CDL match the ACESproxy range. Values outside this range are not clamped.
ACESproxy_CDL_blacklim	Same as ACESProxy_CDL_workflow over the official ACESProxy domain, but has more robust handling of very dark values below the limit of ACESProxy.
float_identity	Useful for projects with EXR files that have gamma or log encoding baked in. For a single clip instead of a whole project, you can instead use float-to-int-identify.ctf in the Transcode settings.

Whenever loading half float media, Post Input LUT should be selected in the Image/CDL menu.

NOTE The floating-point conversion LUT causes linear images to appear similar to log images in Lustre, instead of the way they appear in Flame by default.

Similar to logarithmic media, HDR media requires a viewing LUT in order to look correct on a display or to render to a video color space. This is sometimes referred to as a tone-mapping LUT. This LUT should be selected in the Output tab of the Render settings. See [Rendering Shots](#) (page 591).

You can use a tone-mapping Colour Transform such as the ones in the RRT+ODT directory. Alternatively, you can use one of the legacy 1d-LUT tone maps:

LUT	Description
lin_default_tonemap	An example tone-map output LUT to be used with the lin_default floating-point conversion LUT.

LUT	Description
log_default_tonemap	An example tone-map output LUT to be used with the log_default floating-point conversion LUT.
identityExtended	An output LUT which avoids clipping of HDR information when rendering back to floating-point.

When your goal is to output a floating-point image, either directly to an OpenEXR file, or via rendering to Wiretap as part of an interoperability workflow with an Autodesk Visual Effects and Finishing application, use identityExtended as an output LUT to preserve the extended-range floating-point information. For example, if you are pre-grading OpenEXR media preparing for VFX work, use the identityExtended output LUT during the render.

colour grading Lustre provides interactive colour grading tools for the creation of continuity grades and artistic colour effects. You can perform advanced colour grading in either logarithmic or linear colour space as well as save colour grading settings for future sessions and ongoing use. While you manipulate the colour content of a shot, you can monitor reference images, as well as changes you make to the colour distribution of the shot to ensure that you achieve the result you want.

Because grades are saved as metadata rather than as part of the shot, the original image is always preserved—you can adjust colours without the risk of permanently losing the original colour of your image. Grade metadata is stored on a shot-by-shot basis, ensuring that your colour grades are applied to the correct shot regardless of any changes you make to a cut.

Colour Grading Workflow

colour grading:workflowsThe procedures required to digitally colour grade footage depend on your goal, the shots used in your scene, and the architecture—logarithmic or linear—that you are working in. Scenes consisting of footage shot on the same camera equipment and under consistent conditions may be colour graded quickly and easily. Scenes created from footage shot on multiple cameras across several months and under varying lighting and weather conditions require more work.

Because you often work with a wide variety of shots, there are a variety of workflows you can use when grading a scene. However, it is important to keep in mind the order in which colour grading tasks are processed in Lustre.

The following table outlines processing order and a typical colour grading workflow from balancing a shot to performing final adjustments. You may not complete all the procedures. You may also revisit procedures as you create continuity grades and artistic effects.

Step:	Refer to:
1. Select the project colour space.	Setting Logarithmic or Linear Mode (page 115).
2. With primary colour grading, balance colours in the shot and develop a continuity grade to create a consistent colour look.	Primary Colour Grading (page 415).
3. Further develop the colour look using the RGB and Hue curves.	Colour Grading RGB and Hue Curves (page 433).

Step:	Refer to:
4. Perform secondary colour grading to colour grade objects and colour ranges in the shot.	Secondary Colour Grading (page 443).
5. Use Sparks plugins to apply image processing effects such as grain reduction.	Creating Lustre Sparks Effects (page 525).
6. Adjust the colour look using the RGB curves.	Colour Grading RGB and Hue Curves (page 433).
7. Perform any necessary primary colour grading to adjust the colour look and complete the colour grade.	Primary Colour Grading (page 415).

Colour Grading Concepts

colour grading:concepts Altering the colour content of your footage to create a colour look across a series of shots, scenes, or the entire project is the primary objective of colour grading (also referred to as colour timing). The following concepts are used throughout the colour grading chapters.

Log and Linear Modes

colour grading:selecting Logarithmic or Linear mode Linear mode:using in Lustre Logarithmic mode:using in Lustre In Lustre, you can work in Log or Linear mode. The mode you select defines the colour space, your work environment, and the availability of some hotkeys. In Log mode, you colour grade shots using a film-based toolset and can grade in printer lights. In Linear mode, you colour grade shots using a video-based toolset. For example, if you are familiar with printer light grading, or you are grading logarithmic images, work in Log mode (Log mode is a better grading tool, mathematically, for logarithmic images). If you have more experience working with video and are familiar with the linear toolset, you can use Linear mode. Also, if you are working with linear images and are outputting to linear, it is simpler to work in Linear mode than to convert images to and from Log mode.

Primary Colour Grading

colour grading:primary grading primary colour grading:overview Primary colour grading is applied to the entire image and is used to obtain an overall colour look for each shot used in a series of shots, scene, or entire project. When you perform primary colour grading, you modify the brightness and contrast of the red, green, and blue channels independently. You can modify the red, green, and blue channels together (with the Brightness and Contrast sliders); however, the channels are not codependent—a change made to the red channel does not depend on a change made to the green or blue channel.

You perform primary colour grading at the beginning and end of the colour grading process. In Log mode, you modify brightness, contrast, and saturation across the entire image, as well as brightness in the shadows, midtones, and highlights. In Linear mode, you modify lift, gain, gamma, saturation, and contrast for the red, green, and blue channels across the entire image or in the shadows, midtones, and highlights. You can also clamp minimum and maximum luminance values.

NOTE The intensity of specific colour channels (red, green, and blue) determines whether the pixel is part of the image shadows, midtones, or highlights.

Curves Colour Grading

colour grading:curves gradingcurves colour grading:overviewUse curves colour grading to further modify the RGB and Hue curves. Curves colour grading is well suited, for example, for colour grading a specific range of colours without having to pull a key. Alter the RGB curves to remap red, green and blue values either simultaneously or individually. Use the Hue curves to perform hue shifts, lighten or darken colour ranges, and saturate or suppress colour or luminance ranges. You can also plot colours and add vertices for increased precision.

RGB curves are processed after the initial primary colour grade, and after the application of Sparks effects (if applicable). Hue curves are processed after the initial primary colour grade only.

Secondary Colour Grading

colour grading:secondary gradingsecondary colour grading:overviewUse secondary colour grading to colour grade specific hues and areas in an image. Create secondaries by generating keys and geometries. You can combine keys and geometries to define the area for modification—keys to define a colour or range of colour and geometries to define an area. After areas have been defined, you can colour grade them using the Grading and Curves menus. You can also track objects in the image to animate a geometry used for a secondary colour grade. You can create up to 48 secondary layers. Secondary colour grading is applied after the initial primary colour grade.

Continuity Grade

continuity grades, overviewcolour grading:creating continuity gradesOne of the first steps in the colour grading process is the creation of a continuity grade—a consistent colour look across a series of shots and over time. Continuity grades convey the time frame and should be invisible to the viewer. Generally, continuity grades are created when you balance the colours in the shots—during the initial primary colour grade.

Printer Lights

colour grading:using printer lightsprinter lights:using in Log modePrinter lights are measurements or settings used by colour labs to operate the optical printer that produces the film copy. Because you may want to grade your shots according to printer lights and fstops, Lustre displays the modifications you make to the red, green, and blue content in printer lights when you perform primary and secondary colour grading in Log mode. You set printer light steps that calibrate Lustre with the equipment in the film lab in the Display & Interface tab of the user configuration. See [Display & Interface Settings](#) (page 85).

Accessing Colour Grading Menus

colour grading:accessing Colour menusUse the Colour menu to access the Grading, Curves, Secondaries, Degrain, and Timeline menus.

To access the Colour menu:

- 1 In the Main menu, click Colour.
The Colour menu appears.



(a) Colour grading menus

You can access the following colour grading menus from the Colour menu.

Grading Create the primary colour grade to colour balance your shots, as well as develop the continuity grade. In Log mode, adjust the brightness, contrast, and saturation across the entire image, or adjust the brightness in the shadows, midtones, and highlights. In Linear mode, adjust lift, gain, gamma, saturation, and contrast across the entire image or in the shadows, midtones, and highlights. You can also clamp minimum and maximum luminance values. Enable the Input button for initial primary colour grading, and the Output button to create the final look.

Curves Refine the primary or secondary colour grade. Remap colour values for the red, green, and blue channels individually or all together using the RGB curves. Adjust the hue, saturation, lightness, and luminance using the Hue curves. Enable the Input button to refine the initial primary grade, and the Output button to refine the final colour grade.

Secondaries Define up to 48 secondary layers that can then be graded using the Grading, Curves, Degrain, and Sparks Effects menus. Generate keys that define your secondaries by isolating colour ranges in the image. Create and track geometries to include with, or exclude from, the secondary colour grade.

Degrain Analyse the grain profile of a frame, and use spatial degrain operations to remove grain and noise with secondary layers. See [Removing Grain](#) (page 359).

NOTE To analyse the source image before you begin primary grading, access the Degrain menu from the Image menu instead.

Timeline The colourist's timeline is a simple user interface that allows the colourist to work in a timeline interface without all the timeline editing tools. In this interface you can work in Normal or Solo mode, add cuts and dissolves, and create a new version of a shot. You do not have access to the trimming tools.

Displaying Colour Menus in the Player

playheads:assigning user interface to active playheadPlayer:displaying the user interfaceYou can display the Grading, Curves and Secondaries colour grading menus in the Player next to the image in the currently active playhead. This allows you to:

- Keep the Colour menus available even if you are accessing another menu.
- Display viewing options such as split-screen view on the second head of the graphics card.
- Use the mouse cursor to access the HDSDI head and draw shapes that will appear on the broadcast monitor.

For details on assigning shots to playheads, see [Viewing Reference Images](#) (page 317).

To display Colour menus in the Player:

- 1 Press F7.

The Colour menus appear alongside the image, and are disabled in the main user interface.

NOTE The Hue cube of the Diamond Keyer does not appear in this view mode.



GPU Acceleration

real-time playback:using GPU preview processingGPU preview processing:real-timeProcessing with the Graphics Processing Unit (GPU) is available for certain features and is faster than processing with the Central Processing Unit (CPU).

Support for GPU acceleration depends on the version of the NVIDIA graphic card that is installed on your system. The following configurations are supported for GPU acceleration.

Configuration	Feature available?
FX5800	Yes
FX5600	Yes
FX5500	Yes (except Noise plugin 3.1)

WARNING

Due to the enhancements in the GPU, we do not recommend using Lustre to render grades created in Lustre 2011 or earlier if you are looking for pixel accuracy rendering.

GPU acceleration is available for the following features:

- Playback of cached degraigned frames
- 1D or 3D on calibration LUTs
- Animated or still repositions (including rotations)
- Animated or still input primary grading
- Input and output primary grading with RGB, hue and light saturation (LS) curves
- Secondary grading with RGB curves
- Secondary grading with hue curves
- Secondary black clip/reference and white clip/reference in Linear mode
- Secondary key cleanup and shrink
- Imported mattes for secondaries
- Gamma and contrast adjustments to secondaries in Linear mode
- Low, mid, and high adjustments to secondaries
- Input and render/output LUT
- Lustre Sparks plugins:
 - Blur mix
 - Glow
 - Noise plugin 3.1
 - Printbleach

NOTE A performance hit can occur when using the Lustre Sparks plugins.

For more information about these features, see:

- [Primary Colour Grading](#) (page 415).
- [Colour Grading RGB and Hue Curves](#) (page 433).

- [Creating Lustre Sparks Effects](#) (page 525).

GPU acceleration is also available for certain secondary grading features with up to 48 secondary layers enabled. You can apply, and optionally animate, each of the following secondary grading features and continue to use GPU acceleration:

- Primary grading inside and outside geometries, including adjustments to overall brightness, contrast, hue, and saturation
- Softness, Colour, and Opacity slider values for geometries, with Softer and Variable optionally enabled
- Key-in shapes based on hue, luminance, and saturation, and refined by tolerance and softness range definition
- Key and geometry blurs

NOTE A performance hit can occur when using the geometry blur.

- Multiple point changes for geometries

For more information about these features, see [Secondary Colour Grading](#) (page 443).

When GPU acceleration is enabled, the histogram, vectorscope, and waveform monitors do not dynamically update. They retain the colour distribution of the image before GPU was enabled.

The following parameters cannot be accelerated by the GPU. These parameters are processed by the CPU instead.

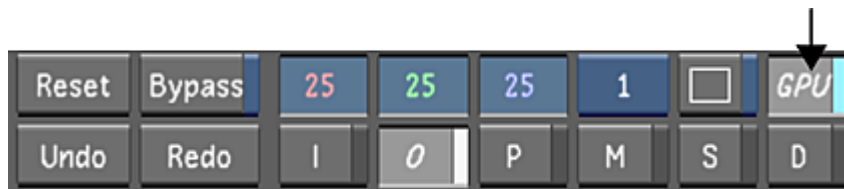
Lustre Sparks plugins:

- Add noise
- Blur
- Defocus
- Directional blur
- Field zoom
- Gold
- Noise plugin 2
- Noise plugin 3
- Silver

NOTE If GPU acceleration is enabled and Lustre encounters a shot with features that cannot be processed by the GPU, the CPU is used for the shot. The GPU button remains enabled, but is greyed out until you navigate to the next shot in the timeline that contains features available for GPU acceleration.

To enable GPU acceleration:

- 1 Do one of the following:
 - Click GPU.
 - Press γ .



A GPU flag appears in the upper-right section of the Player.



NOTE GPU acceleration only works in progressive scan mode. Before you render a project, you need to switch the scan type to interlaced (located in the Setup > Grade menu).

To disable GPU acceleration:

1 Do one of the following:

- Click GPU.
- Press Y.

GPU acceleration is disabled.

GPU Auto Switch

GPU preview processing:GpuNoAutoSwitch parameterBy default, when you use a feature that is not supported by GPU (while in GPU acceleration mode) it automatically switches to CPU processing mode. The GPU button is greyed out in the user interface to show you that this feature is not GPU compatible. You can prevent the switch to CPU mode by disabling the GPU Auto Switch feature, see [Display & Interface Settings](#) (page 85). When you disable the GPU Auto Switch button, you can only see features which are supported by GPU (when GPU acceleration is enabled). To see all of the features, you have to disable the GPU button.

Colour Grading With the Control Surfaces

control surfaces:using for colour gradingcolour grading:using control surfacesThe control surfaces facilitate colour grading work by accelerating interactivity with the shots. You can use control surfaces to perform many colour grading tasks. The dials and trackballs give you precise control over the colour effects you create.

Viewing Multiple Shots

comparing:shots using multi-viewshots:comparing multiple in the PlayerYou can view multiple shots in the Player while you work. These views are useful when you want to compare shots in a cut to ensure continuity, match colours, or view a group of shots in which the colour grading parameters you are modifying are ganged. See [Using Dual View](#) (page 334) and [Using Multi View](#) (page 336).

Reference Images

comparing:shots using a referenceshots:comparing using a referenceYou can view a reference image while you work. For example, use a reference image to visually compare the current shot to another when you develop a continuity grade. Reference images are stored in the frame buffer and are loaded from your cut or from the Grade bin. You can only have one reference image stored in the frame buffer at a time. You can

switch between different reference images to ensure continuity and consistency throughout the project. See [Viewing Reference Images](#) (page 317).

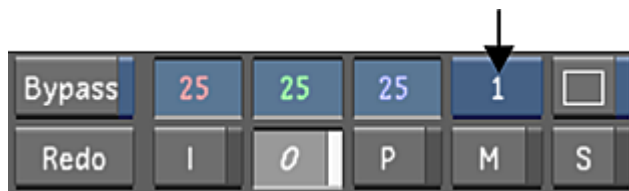
Viewing Proxies

shots:setting to half resolutionproxies:viewingAfter you generate proxies, you can view proxies while you colour grade your shots. It is useful to view proxies if interaction slows down. This can occur when you perform secondary colour grading on high-resolution images because a large amount of processing is required to display the result at full resolution.

Proxy view is set on a shot-by-shot basis. To view proxies, you must first generate them. See [Generating and Viewing Proxies](#) (page 603).

To view proxies:

- 1 Do one of the following:
 - On the function control surface for the Autodesk control surface, press the Proxy button.
 - On the Tangent CP100 control surface, press the Resolution button.
 - Press F9.
 - Click the Resolution button.



The full-resolution image in the Player is replaced by the proxy (half-resolution) image. Use the same procedure to toggle between the full-resolution image and the proxy.

NOTE If you have not generated a proxy for the shot, an X will appear in the Player.

Analysing the Image

analysing:colourscolours:analysingWhile you colour grade, you can use different tools to view and analyse colours. Use the Analyse tools to view the colour distribution in the current frame. Use the Pixel Analyser to sample the image to compare colour values used in the input (original) and output (result) images.

Sampling Colour Values

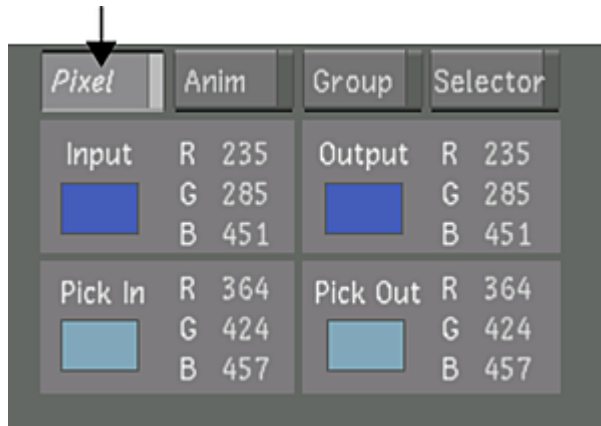
Pixel Analyser, sampling imagescolours:sampling valuesWhen you generate mattes, modify shots, or match colours between shots, you can sample the current image in the Player. When you sample the image, the input and output colour values are displayed in the Pixel Analyser.

The sample will appear in the Curves menu so you can view input colour values when you refine the image. R, G, and B colour values are plotted separately on the RGB curves while the combined RGB colour value is plotted on the Hue, Saturation, Lightness, and Luminance curves.

When you create a key, you must sample the image to set tolerance and softness values. See [Creating a Secondary by Keying a Range of Colours](#) (page 477).

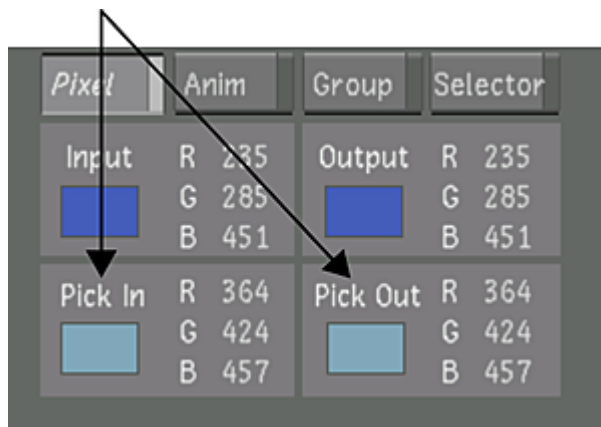
To sample colour values:

- 1 Select the frame in the shot you want to sample.
- 2 Click Pixel to display the Pixel Analyser.

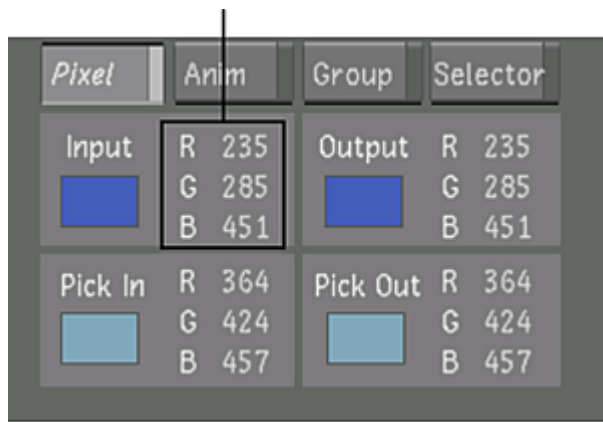


- 3 In the Player, do one of the following:
 - Drag the image to sample a single pixel in the image. You can drag through the image until you locate the pixel you want to sample.
 - Alt-click to sample an average taken from a range of colours in the image.

The sample appears in the Pixel Analyser.



- 4 (Optional) Press E to change the display value. You can display the colour in three different formats: colour, F-stop/float value, or high dynamic range (HDR).



Display Value	Description
Colour	Displays the colour value for all types of media.
F-stop/Float value	F-stop is only applicable for 10-bit media (whereas the 8 and 16-bit media retains the colour value). Float value is only applicable for the Input value of OpenEXR media.
HDR	Displays the colour input value from -1 to 3 for OpenEXR media. For the other media, the colour value is from 0 to 1.

NOTE For OpenEXR media the F-stop value is replaced by the media's float value and the HDR range is only applicable to the Input value. The Input HDR range is from -1 to 3 for OpenEXR media, but for all other media the range is from 0 to 1.

Viewing Colour Distribution

Analyse tools: using to view colour distributions. There are a variety of Analyse tools that you can use to view the colour distribution in the current frame. Analyse tools are useful when you want to determine the original structure of the image and see how a grade transforms the colour space.

You can display up to three Analyse tools at one time. Use these tools to help match colours, view the colour distribution, adjust shadows and highlights, and ensure that broadcast and other standards are met. You can display the following Analyse tools while you colour grade.

Histogram Displays the distribution of image pixels across the luma range for the R, G, and B channels.

Waveform monitor Displays the R, G, B channels separately or together as a waveform.

Vectorscope Displays the distribution of image pixels across luma and hue ranges.

The Analyse tools show the changes you make to the colour content in a shot. Each tool is dynamically updated to reflect your changes as you modify the image.

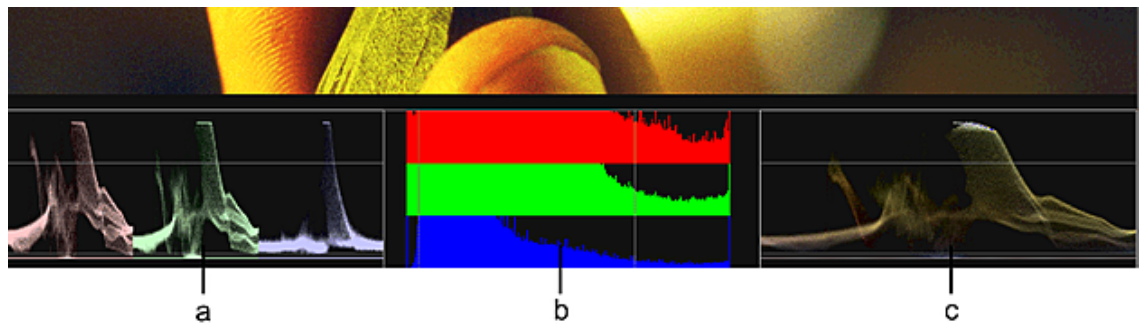
NOTE The histogram, vectorscope, and waveform monitor do not dynamically update if GPU acceleration is enabled. They retain the colour distribution of the image prior to GPU being enabled.

To view colour distributions:

- 1 Display up to three Analyse tools to view the colour distribution of the image.

Press:	To display:
Alt+1	The RGB waveform monitor.
Alt+2	The RGB histogram.
Alt+3	The luminance waveform monitor.
Alt+4	The vectorscope.

TIP You may need to move the shot in the Player up in order to see the Analyse tools below it.



(a) Waveform monitor (with RGB channels displayed separately) **(b)** Histogram **(c)** Waveform monitor (with RGB channels displayed together)

NOTE Right-clicking over any of these monitoring tools either zooms you in, or adjusts the tool's luminance value.

To view the RGB histogram for two images simultaneously:

- 1 Press F5.
The last used view is displayed—either Dual View or Multi View. Dual View displays two frames at the same time while Multi View displays the entire frame of one or more shots.
- 2 If Multi View is displayed, press F4 to activate Dual View.
The current frames on Playheads A and B are displayed either horizontally or vertically, depending on the last displayed orientation.
- 3 Press F1 or select A from the Playhead button and then select the shot in the Storyboard.
The shot you are working on is assigned to Playhead A.
- 4 Press Alt+2 to display the histogram for the shot assigned to Playhead A.
- 5 Press F2 or select B from the Playhead button.
The shot is assigned to Playhead A.
- 6 Press Alt+2 to display the histogram for the shot assigned to Playhead B.

Saving and Loading Presets Using the Presets Lists

To increase the efficiency and speed of the colour grading process, you can save a limited set of the colour grading parameters that you plan to reuse on a regular basis. These predefined settings, or presets, are saved on a menu-by-menu basis and are stored in the Presets lists.

Saving Presets

colour grading:saving presetspresets:saving colour grading parametersSave settings from the current Colour menu to a preset. You can save settings to the following Presets lists:

- Grade presets
- Curves presets
- Geometry presets
- Gmask raw import
- Tracker presets
- Key presets
- Degrain presets

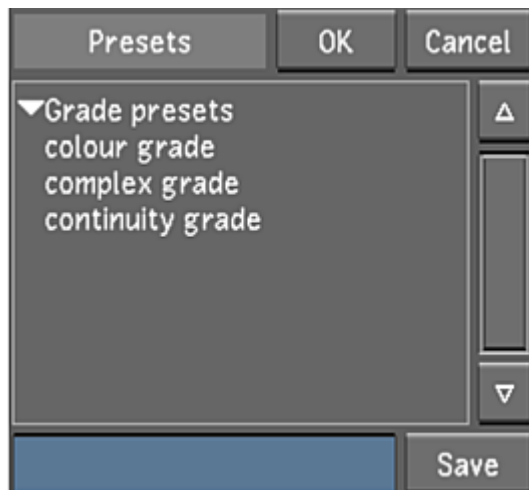
NOTE Saving to a preset saves the settings currently displayed in the Player. For example, if you save to a preset in the middle of a colour dissolve or animation, this timeline position is saved to the preset file. Saving to a preset is a good way to save and load animation keyframes.

To save a preset:

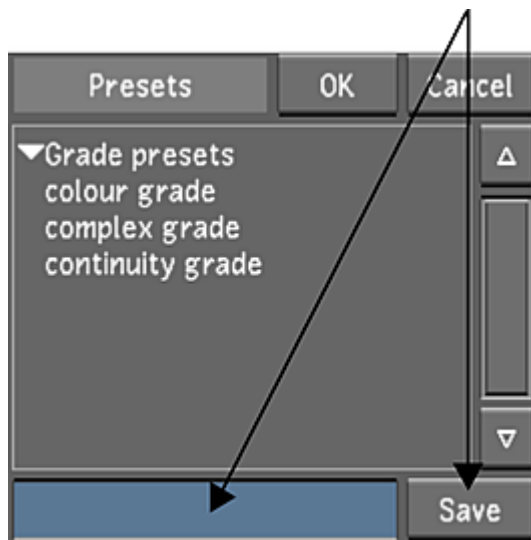
- 1 Click the Presets button in the Colour menu or right-click Grading, Curves, or Secondaries.

NOTE You can also right-click the Hue, Luminance, or Saturation button in the HLS Keyer as well the Presets colour buttons in the Diamond Keyer.

The affiliated Presets list appears. For example, if you right-clicked the Grading menu, the Grade presets list appears.



- 2 In the Colour menu, make any necessary modifications to the settings to create the colour look you want.
- 3 In the Presets Name field, enter a name for the preset, and then click Save.



NOTE Spaces are not permitted in naming conventions. It is recommended that underscores be used instead of spaces when working on either Linux or Windows.

The settings in the current menu are saved to the preset. The preset appears in the Presets list.

TIP To save the settings to an existing preset, select the preset in the Presets list.

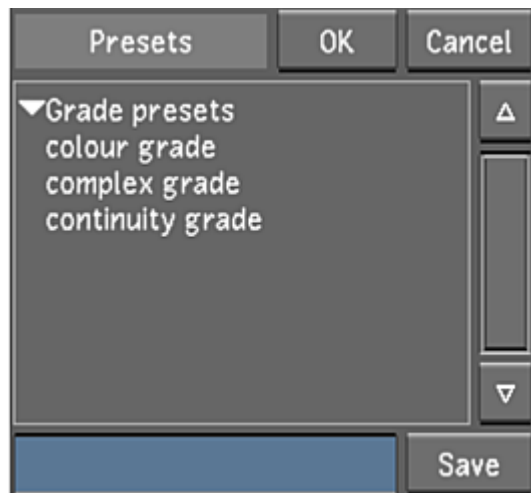
Loading Presets

colour grading:loading presetspresets:loading colour grading parametersIncrease efficiency by loading presets to the current shot when you want to reuse Colour menu settings. Preview the effect a preset will have on a shot before you apply the settings.

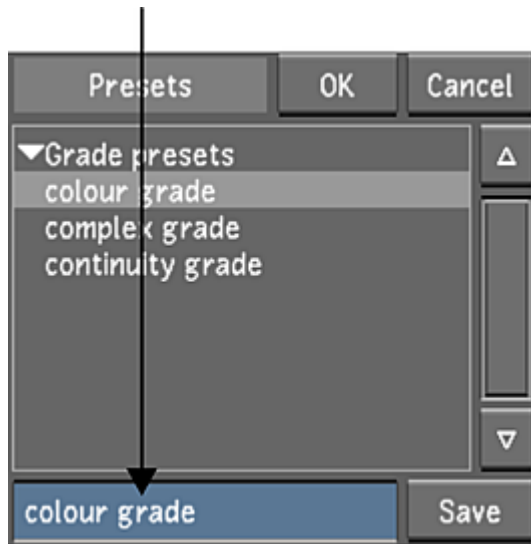
To load a preset from a Presets list:

- 1 Click the Presets button in the Colour menu or right-click Grading, Curves, Secondaries, Degrain, or the Keyer.

The affiliated Presets list appears. For example, if you right-clicked the Grading menu, the Grade presets list appears.



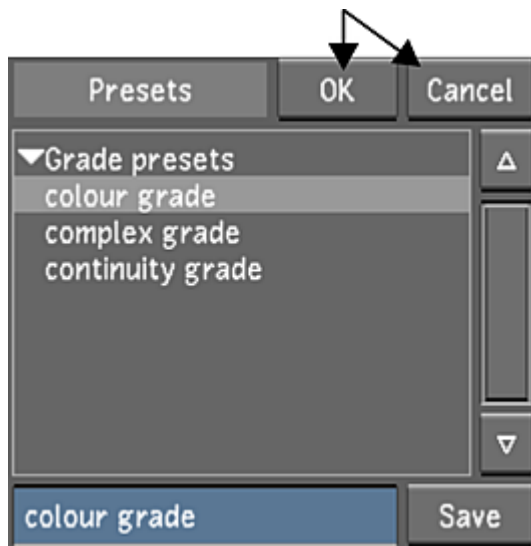
- 2 Select a preset in the list.



The image in the Player is updated with the settings from the preset so that you can preview the effect.

- 3 Do one of the following:
 - Click OK to apply the settings.

The settings are applied to the image and the Colour menu. The other Colour menus are unaffected.
 - Click Cancel to revert to the previous settings in the Colour menu.



Colour Grade Animation

animating:colour gradescolour grading:animating gradesUse the Animation controls to animate colour grades. You can animate any parameter from the Colour menus except those in the Curves menu. For example, animate a colour grade to convey a change in the ambient light. To access the Animation controls, click the Anim button. See [Animation](#) (page 541).

Grade Bin Storage

During the colour grading process, use the Global Grade bin or Scene Grade bin as a framestore for reference images and as a scratch pad for grades. Grade settings are stored in the Grade bins on a shot-by-shot basis. See [Using Grade Bins](#) (page 151) and [Using the Expanded Grade Bin](#) (page 159).

Colourist Multi-Layer Timeline

colourist timelineTimeline:colouristThe colourist multi-layer timeline allows you to perform limited editing functions within the Colour menu. Grading information (a selection of a shot's grading information or all of the grading information) can be copied from one shot to another or to several others.

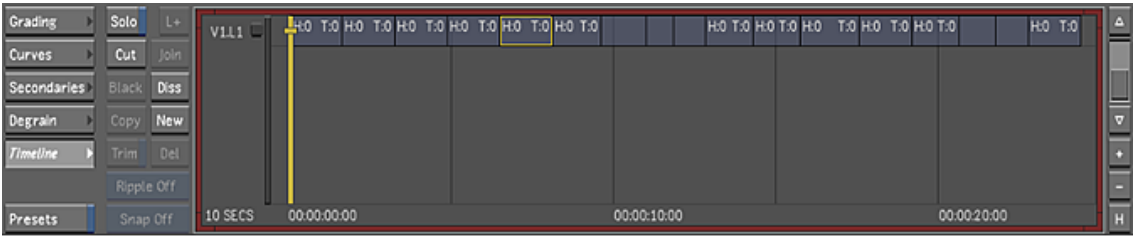
NOTE The functions in the colourist multi-layer timeline are not accessible if your timeline is in sort mode. See [Timeline Sort Mode](#) (page 338).

Accessing the Colourist Timeline Menu

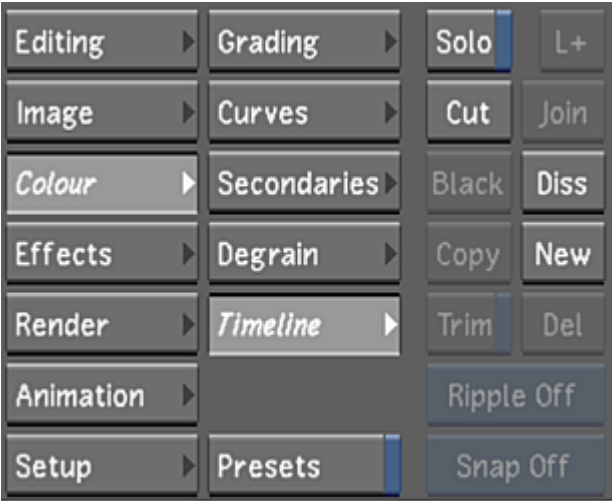
To edit shots in the colourist timeline view, you need the Timeline menu.

To access the colourist timeline menu:

- 1 In the Main menu, click Colour.
 - 2 Click Timeline.
- The colourist timeline menu appears.



The timeline is made up of the following buttons.



Solo Within a multi-layer timeline, Solo mode displays the layer which the Focus point is positioned on. The Storyboard is updated to only display the shots in the soloed layer. When Solo mode is disabled, the top layer, by default, is displayed in the Storyboard and Player.

NOTE If you are using the solo function as a method to create editorial or grade version, please keep in mind that the status is not part of the grade file data structure. Therefore, this state will not be saved upon restarting Lustre.

Cut Adds a splice at the positioner location on the focused layer.

Diss Adds a dissolve at the positioner location on the focused layer.

New Copies the current element to the next available top layer with grade data.

For more information about the multi-layer timeline, see [Multi-Layer Timeline](#) (page 277).

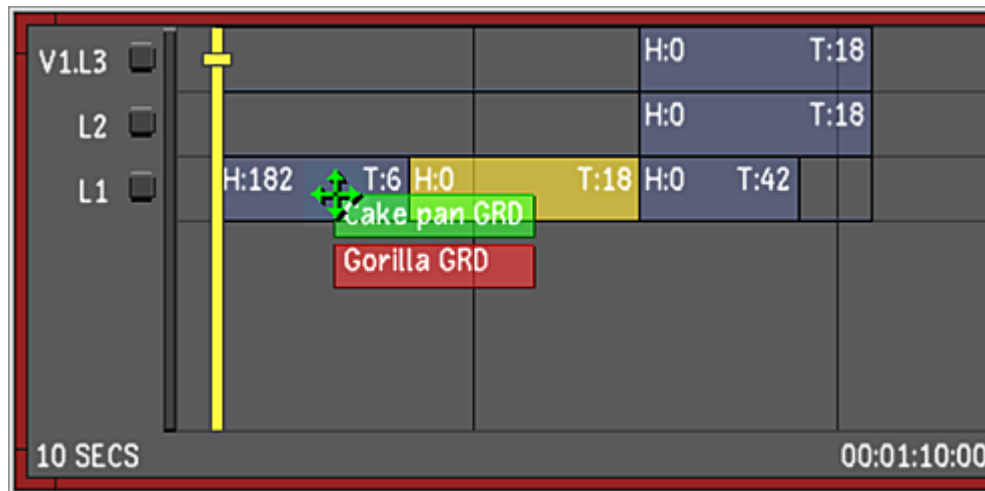
Copying Grading Information in the Colourist Timeline

copying:grades in the colourist timeline;grades:copying in the colourist timelineThere are several procedures for copying grading information using the colourist timeline. You can easily drag and drop all or a selection of grading information from shot to shot (or to multiple shots). You can also drag and drop grading information from multiple shots to an equal number of shots.

To copy all grading information from one shot to another:

- 1 In the colourist multi-layer timeline, hold down the **Ctrl** key and drag from the graded shot to the destination shot.

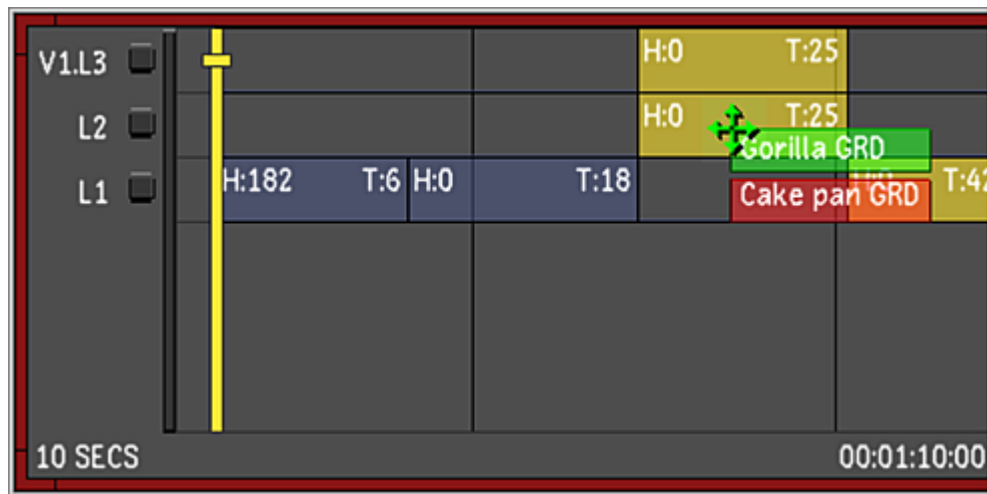
When you move your mouse over a shot, a green indicator displays the graded shot's name. A red indicator displays the destination shot name.



- 2 Drop the selection when the cursor is over the desired destination shot.
The entire shot's grading information is copied to the destination shot.

To copy all grading information from one shot to multiple shots:

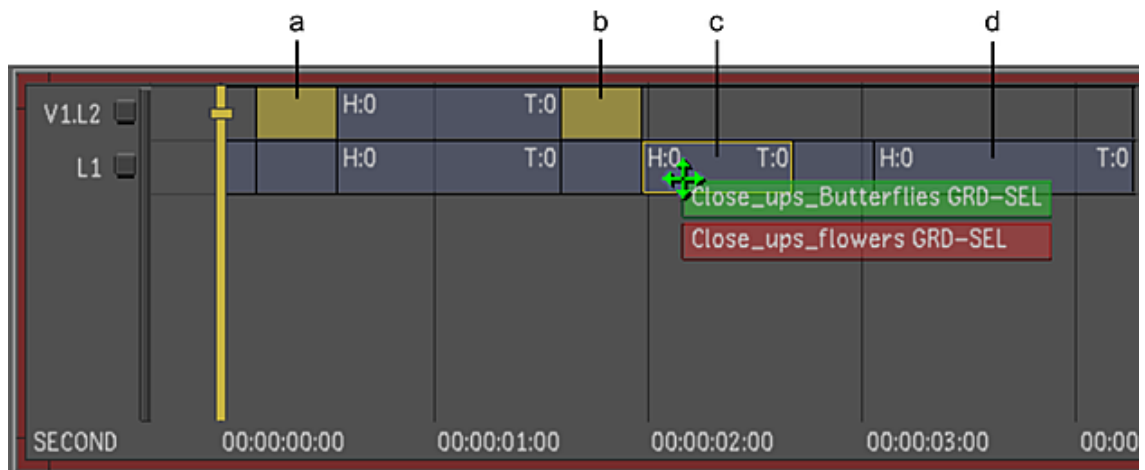
- 1 In the colourist multi-layer timeline, create a timeline selection of shots to which you wish to copy grading information. See [Selecting Elements](#) (page 283).
- 2 Hold down **Ctrl** and **Shift** and drag from the graded shot to any of the selected shots.
When you move your mouse over a shot, a red indicator displays the destination shot name.



- 3 Drop the selection when the cursor is over any destination shot that is in your selection.
The entire shot's grading information is copied to the selected shots.

To copy all grading information from multiple shots to a different set of shots:

- 1 In the colourist multi-layer timeline, select two or more shots with the grades you wish to copy. See [Selecting Elements](#) (page 283).
 - 2 Hold down the **Ctrl** and **Shift** keys and drag the first shot in the selection to the first destination shot to be graded.
- When you move your mouse over a shot, a green indicator displays the shot name and a red indicator displays the destination shot name.



(a) First graded shot selection (b) Second graded shot selection (c) First destination shot (d) Second destination shot

- 3 Drop the selection when the cursor is over the first destination shot.
The grading of each shot is applied to a corresponding destination shot. In the example above, if you drag a broken selection of the first and third shot and drop it on the fifth shot in another layer, then the fifth and seventh shot in that layer will be graded, respectively.

To copy a defined selection of grading information from one shot to another:

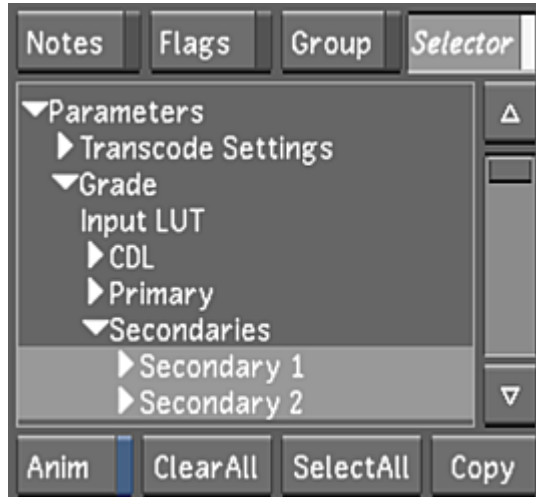
- 1 Using the various grading tools, grade a shot to your satisfaction.

- 2 In the Timeline menu, enable the Selector button.



- 3 Specify what parameters to copy:
 - To select all the channels in a directory, select the directory.
 - To select specific channels in a directory, expand the directory and select any of its channels.

The channels within selected directories become bold white.



- 4 Hold down the `Ctrl` and `Alt` keys and left-click+drag from the graded shot to the desired destination shot.

A green indicator displays the graded shot's name. A red indicator displays the destination shot's name when you move your mouse over a shot.
- 5 Release the `Ctrl` and `Alt` keys and mouse button when the cursor is over the destination shot.

The grade is copied to the destination shot.

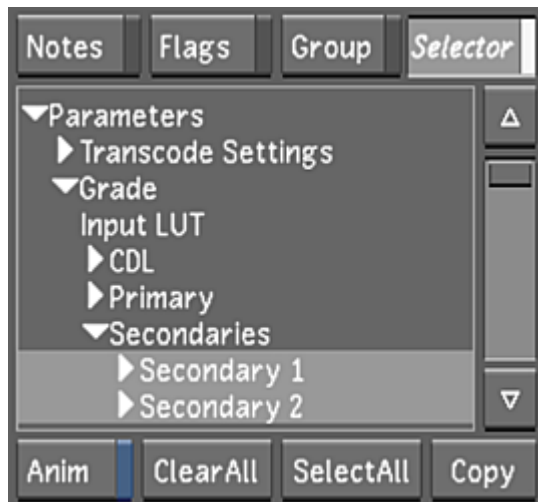
To copy a defined selection of grading information from one shot to multiple shots:

- 1 Using the various grading tools, grade a shot to your satisfaction.
- 2 In the colourist multi-layer timeline, create a timeline selection of shots to which you wish to copy grading information. See [Selecting Elements](#) (page 283).
- 3 In the Timeline menu, enable the Selector button.



- 4 Specify what parameters to copy:
 - To select all the channels in a directory, select the directory.
 - To select specific channels in a directory, expand the directory and select any of its channels.

The channels within selected directories become bold white.



- 5 Hold down **Ctrl**, **Shift**, and **Alt** and left-click+drag from the graded shot to any of the selected shots. A green indicator displays the graded shot's name. A red indicator displays the destination shot's name when you move your mouse over a shot.
- 6 Release the **Ctrl**, **Shift**, and **Alt** keys and mouse button when the cursor is over any destination shot in your selection.
The grade is copied to the destination shot selection.

Primary Colour Grading

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primary colour grading:overviewcolour grading:primary gradingPrimary colour grading is applied to the entire image and is used to obtain an overall colour look. With primary colour grading, you modify the primary colour channels (red, green, and blue) independently. Although you can manipulate these colour channels simultaneously, the modifications you make to one colour channel will not depend on the pixel intensity of the other colour channels.

When you perform primary colour grading, you can develop a continuity grade to create a consistent colour look for shots at the beginning of the colour grading process, and then perform any final adjustments to readjust the colour look and complete the colour grade at the end of the process.

You perform primary colour grading in either Log mode or Linear mode. In Log mode, you can modify brightness, contrast, pivot point, and saturation. In Linear mode, you can modify lift, gain, gamma, saturation, and contrast values, as well as clamp minimum and maximum luminance values.

TIP For faster playback on shots with input primary grading applied, enable GPU processing by clicking the GPU button. See [GPU Acceleration](#) (page 400).

WARNING The Histogram, Waveform, and Vectorscope functions do not update when GPU processing is enabled.

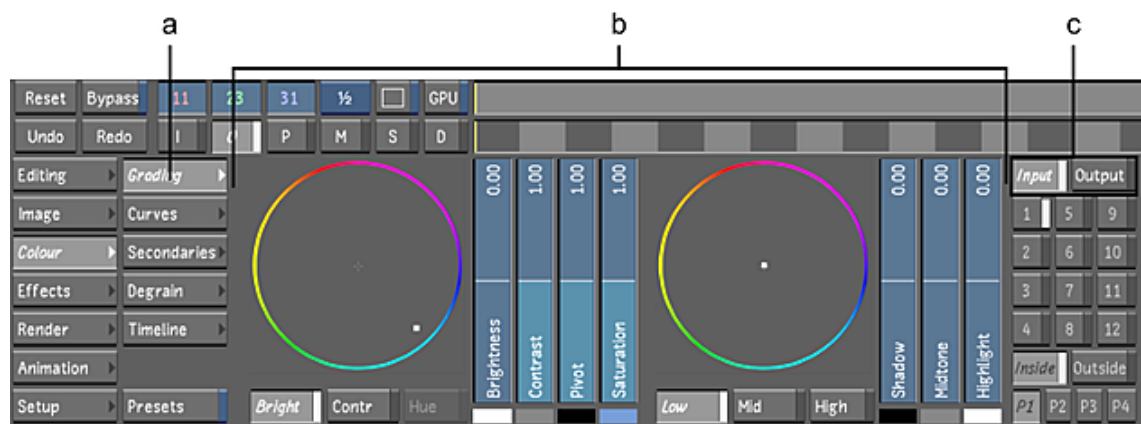
Accessing the Grading Menu

Primary colour grading is done from the Grading menu.

To access the Grading menu:

- 1 Do one of the following:
 - In the Main menu, click Colour and then Grading.
 - Press F7. See [Displaying Colour Menus in the Player](#) (page 398).

The Grading menu appears.



(a) Grading button (b) Grading menu (Log mode) (c) Input and Output buttons

- 2 Enable one of the following buttons.

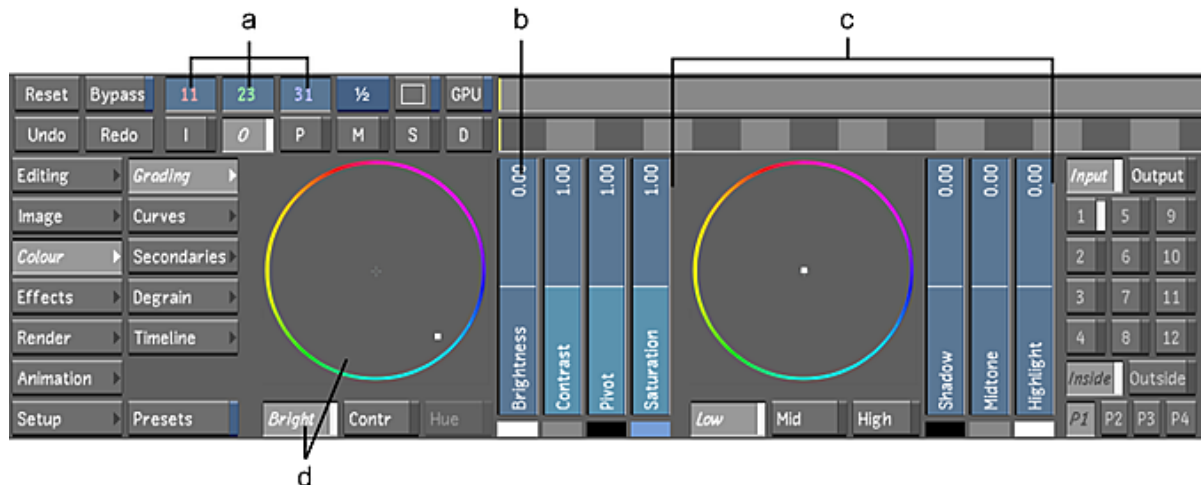
Input Enables input primary grading. Use it to perform primary colour grading at the beginning of the colour grading process.

Output Enables output primary grading. Use it to perform primary colour grading at the end of the colour grading process, that is, after RGB and Hue modifications, as well as selective grading have been performed.

NOTE The Hue setting is only enabled for selective colour grading.

Logarithmic Mode: Modifying the Brightness

When you modify brightness, colours appear to emit more or less light. You can modify brightness across the entire image or just in the shadows, midtones, and highlights. You can also view and make printer light adjustments. Reset the brightness settings to their original values at any time.



(a) Printer light settings (b) Brightness slider (c) Brightness controls for shadows, midtones, and highlights (d) Brightness Balance wheel and button

If you want to modify R, G, B curves individually and within a particular range, use the RGB curves. See [Modifying Red, Green, and Blue Channels](#) (page 435).

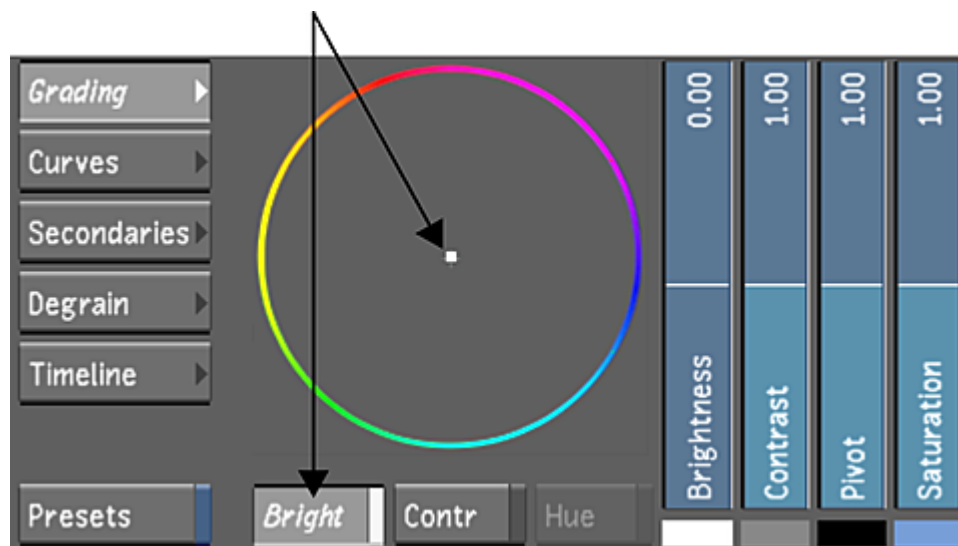
Modifying Brightness in the Entire Image

brightness:modifying for the entire imageLogarithmic mode:modifying brightness for the entire imageYou can increase or decrease colour brightness across the entire image. Use the Brightness slider to modify the brightness of the red, green, and blue levels uniformly. Use the Brightness Balance wheel to balance colours, remove or add a colour cast, create a sense of time, or create ambience. When you use the Brightness Balance wheel, you modify RGB levels proportionally without changing the overall brightness. For example, if you drag the Brightness Balance wheel toward blue, blue will appear to emit more light while red and green will appear to emit less; the image may therefore develop a blue cast.

NOTE When you use a slider or colour balance wheel to colour grade a shot, the colour range is limited by the control (the edge of the colour wheel, for example). Use either the Autodesk control surface or the Tangent CP100 control surface to reach the full spectrum of colour.

To modify the brightness in the entire image:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Modify the overall brightness:
 - To increase the overall brightness in the image, drag the Brightness slider up.
The colours in the image appear to emit more light. The printer light settings are also updated to reflect your changes.
 - To decrease the overall brightness in the image, drag the Brightness slider down.
The colours in the image appear to emit less light.
- 3 To balance the colours in the image, create ambience, or develop a colour cast, enable Brightness and then drag the Brightness Balance wheel towards the colour you want to increase in the image. For example, to create a cooler image, drag toward blue; to create a warmer image, drag toward red.



The colours are balanced in the image without affecting the overall brightness. The printer light settings are also updated to reflect your changes.

TIP When you click on the printer lights, the printer light values are replaced by values based on the center point of the colour wheel.

- 4 Make adjustments to the image using the Brightness slider and Brightness Balance wheel until you are satisfied with the results.

TIP When working with any of the vertical sliders in the Grading menu, refer to their numerical values in order to make more precise adjustments. The default value for each of the sliders reflects the mid-point in the range of available values. For example, the Brightness slider has a range of -25 to 25, and a default mid-point value of 0. The Contrast slider, on the other hand, has a range of 0 to 2, making for a mid-point default value of 1.

Adjusting Printer Lights for Primary Grading

printer lights:adjusting brightnessbrightness:adjusting printer lightsLogarithmic mode:adjusting printer lightsYou can make printer light adjustments to the entire image when you want to grade your shots according to printer lights and fstops. You can adjust the level of the overall colour brightness or the level of the RGB/CMY values independently. You can then send the printer light settings to the film lab for processing. Printer light steps are set in the Display & Interface page of the user configuration. See [Display & Interface Settings](#) (page 85).

NOTE Hotkeys for printer light adjustments only work in Log mode.

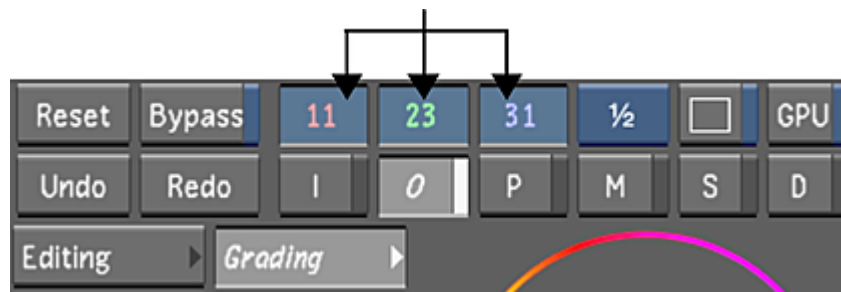
To modify brightness by printer lights:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Use the following keypad hotkeys to make printer light adjustments to the image.

Press:	To:
+ (plus sign)	Increase overall brightness by one step. Press <code>Shift++</code> to increase overall brightness by a half step.
Enter	Decrease overall brightness by one step. Press <code>Shift+Enter</code> to decrease overall brightness by a half step.
NumLock	Increase red brightness by one step. Press <code>Shift+NumLock</code> to increase red brightness by a half step.
7	Decrease red brightness by one step. Press <code>Shift+7</code> to decrease red brightness by a half step.
/ (divide sign)	Increase green brightness by one step. Press <code>Shift+/</code> to increase green brightness by a half step.
8	Decrease green brightness by one step. Press <code>Shift+8</code> to decrease green brightness by a half step.
* (multiply sign)	Increase blue brightness by one step. Press <code>Shift+*</code> to increase blue brightness by a half step.

Press:	To:
9	Decrease blue brightness by one step. Press Shift+9 to decrease blue brightness by a half step.
4	Increase cyan brightness by one step. Press Shift+4 to increase cyan brightness by a half step.
1	Decrease cyan brightness by one step. Press Shift+1 to decrease cyan brightness by a half step.
5	Increase magenta brightness by one step. Press Shift+5 to increase magenta brightness by a half step.
2	Decrease magenta brightness by one step. Press Shift+2 to decrease magenta brightness by a half step.
6	Increase yellow brightness by one step. Press Shift+6 to increase yellow brightness by a half step.
3	Decrease yellow brightness by one step. Press Shift+3 to decrease yellow brightness by a half step.
- (minus sign)	Reset overall brightness.

The printer light settings for the R, G, and B values are updated to reflect your changes.



NOTE Printer light settings do not include any modifications you make to brightness in the shadows, midtones, or highlights. See [Modifying Brightness in the Shadows, Midtones, and Highlights](#) (page 419).

TIP When you click on the printer lights, the printer light values are replaced by values based on the center point of the colour wheel. If you then right-click one of the colour wheel values, the calculator appears in the UI, allowing you to enter a value.

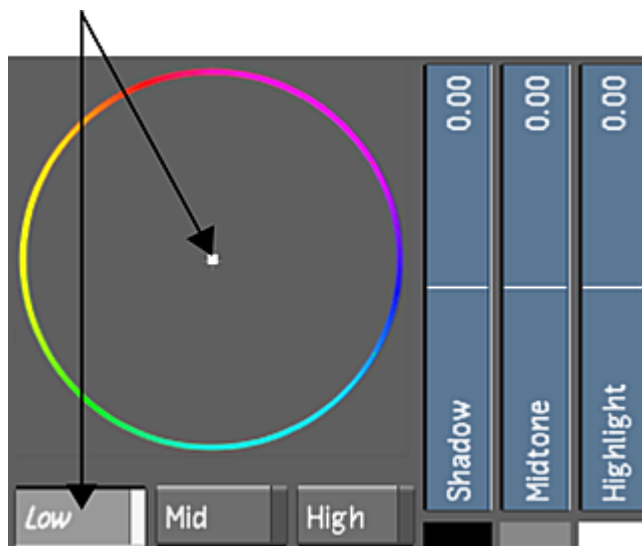
Modifying Brightness in the Shadows, Midtones, and Highlights

brightness:modifying for low, mid, or high levelsLogarithmic mode:modifying brightness for low, mid, or high levels You can increase or decrease the brightness in the shadows, midtones, or highlights. Use the Shadow, Midtone, or Highlight slider to modify the brightness of the red, green, and blue levels uniformly. Use the Low, Mid, or High Balance wheel to balance colours by modifying RGB levels proportionally.

NOTE When you modify brightness in the shadows, midtones, or highlights, your changes are not reflected in the printer light settings.

To modify the brightness in the shadows, midtones, and highlights:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Adjust the overall brightness:
 - To adjust the overall brightness in the shadows, drag the Shadow slider. Drag up to increase brightness. Drag down to decrease brightness.
 - To adjust the overall brightness in the midtones, drag the Midtone slider. Drag up to increase brightness. Drag down to decrease brightness.
 - To adjust the overall brightness in the highlights, drag the Highlight slider. Drag up to increase brightness. Drag down to decrease brightness.
- 3 Balance the brightness of colours:
 - To balance the brightness of the colours in the highlights, enable High and then drag the High Balance wheel toward the colour you want to increase in the image.
 - To balance the brightness of the colours in the midtones, enable Mid and then drag the Mid Balance wheel toward the colour you want to increase in the image.
 - To balance the brightness of the colours in the shadows, enable Low and then drag the Low Balance wheel toward the colour you want to increase in the image.



Resetting Overall Brightness

brightness:resettingLogarithmic mode:resetting brightnessYou can reset the image brightness using the keypad hotkey.

To reset Brightness settings:

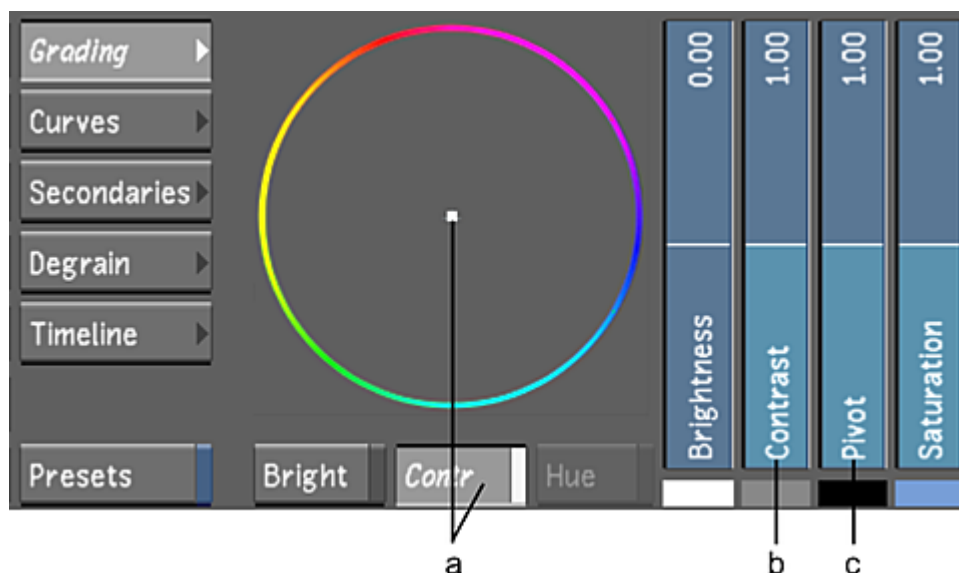
- 1 Press – (minus sign) on the keypad.

The Brightness slider and Brightness Balance wheel are reset to their default settings. Printer light settings are also reset and the image reverts to its original printer light settings.

NOTE Modifications you made to the image using the Brightness controls for shadows, midtones, and highlights are not reset to their default values. See [Resetting Parameters](#) (page 133).

Logarithmic Mode: Improving Contrast

contrast:modifying in Logarithmic modeLogarithmic mode:improving contrastPoor image contrast can be caused by various factors. For example, when you remove a colour cast from a shot, the shot may become washed out. Washed out images usually occur when image contrast and saturation levels are too low. To complete the task of balancing the colours in the shot, use the Contrast controls to correct poor contrast. When you correct contrast, you can also set the pivot point and saturation levels. See [Setting the Pivot Point](#) (page 422) and [Modifying Saturation](#) (page 423).



(a) Contrast Balance wheel and button (b) Contrast slider (c) Pivot slider

NOTE When you use a slider or colour balance wheel to colour grade a shot, the colour range is limited by the control (the edge of the colour wheel, for example). Use the Autodesk control surface or the Tangent CP100 control surface to reach the full spectrum of colour. You can also use the standard Lustre calculator to extend beyond the UI colour range. To access the calculator, click on the printer lights and then right-click one of the colour wheel values.

Modifying Image Contrast

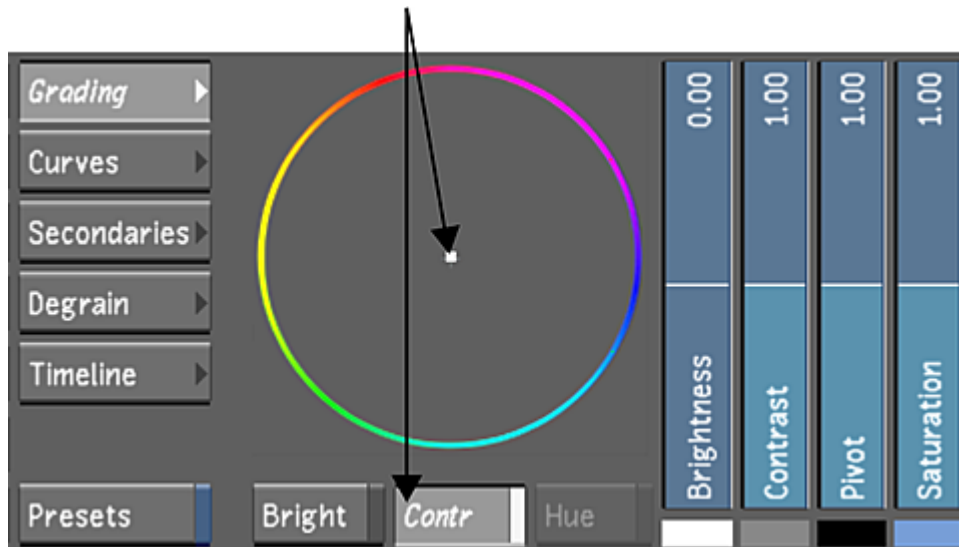
Improve image contrast by modifying the film gamma with the Contrast slider. Use the Contrast Balance wheel to increase the contrast of any channel while decreasing the contrast of other channels. These changes in contrast are relative to the pivot point.

NOTE To see how balancing the contrast works, view the histogram. Press **Alt+2** while modifying the contrast balance and the pivot point.

WARNING The Histogram, Waveform, and Vectorscope functions do not update when GPU processing is enabled.

To improve image contrast:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Modify the contrast:
 - To increase the contrast in the image, drag the Contrast slider up.
 - To decrease the contrast in the image, drag the Contrast slider down.
- 3 To increase contrast in a range of colour in the image, enable Contrast and then drag the Contrast Balance wheel towards the colour.



The colour you drag toward increases in contrast while the opposing colours decrease in contrast. The overall image contrast remains the same.

NOTE The pivot point is the point around which the contrast balanced. See [Setting the Pivot Point](#) (page 422).

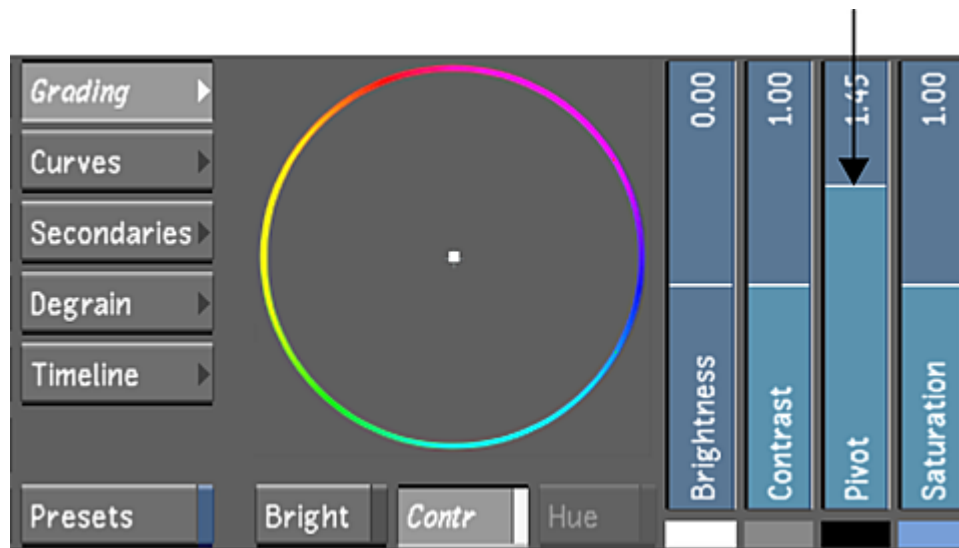
- 4 Make adjustments to the image using the Contrast slider and Contrast Balance wheel until you are satisfied with the results.

Setting the Pivot Point

contrast:setting the pivot pointLogarithmic mode:setting the pivot pointYou can set the pivot point for contrast. The pivot point is the anchor around which contrast is scaled. By default, the pivot point is set to the midpoint in the image. You can move the pivot point to scale the contrast around the image highlights or shadows.

To set the pivot point:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Drag the Pivot slider to move the anchor around which the contrast is modified. Drag up to modify contrast around highlights. Drag down to modify contrast around shadows.

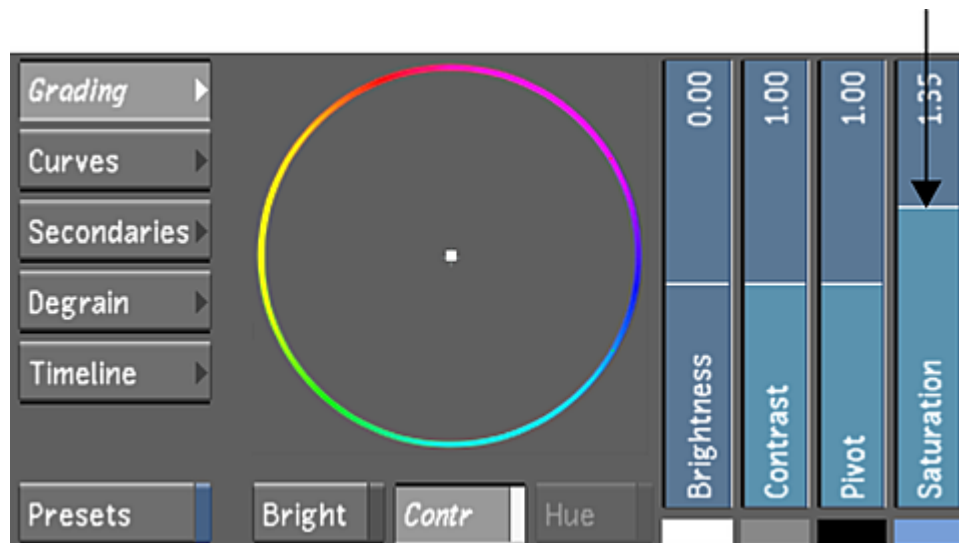


Modifying Saturation

saturation:modifying in Logarithmic modeLogarithmic mode:modifying saturationControl the image's colour intensity by modifying saturation levels.

To modify the saturation level:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Modify the saturation:
 - To increase the saturation in the image, drag the Saturation slider up.
 - To decrease the saturation in the image, drag the Saturation slider down.



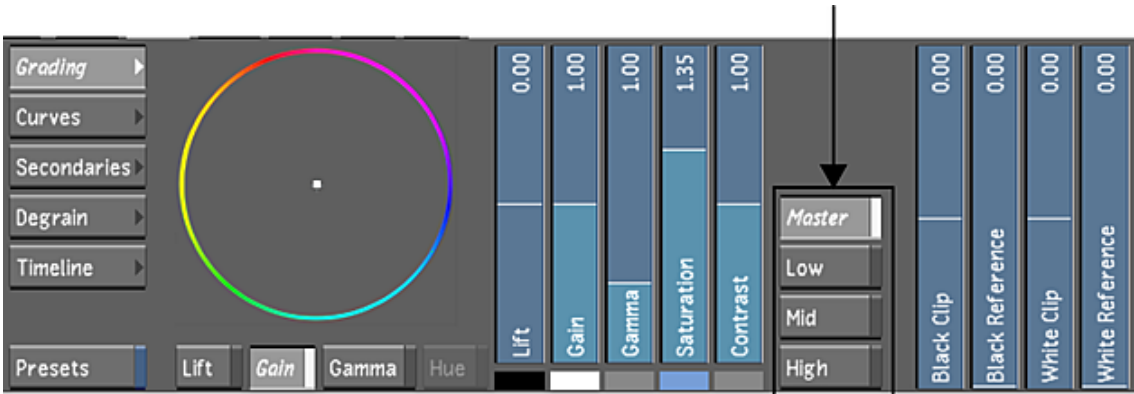
Linear Mode: Selecting Levels of the Image

levels, selecting in the image for colour gradingLinear mode, selecting levelsYou can modify lift, gain, gamma, and saturation in the low, mid, and high levels of the image, or across the entire image. Select the range you want to modify while performing primary colour grading. You can also define values to clamp minimum and maximum luminance values.

NOTE You can use the Tangent CP100 control surface when you want to colour grade the entire image, not an individual level. You can use the Autodesk control surface for either the entire image or an individual level.

To select a level of the image for colour grading:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Enable the appropriate button to select the entire image or a level of the image for primary colour grading.



Enable:	To perform primary colour grading on:
Master	The entire image.
Low	The low levels of the image.
Mid	The mid levels of the image.
High	The high levels of the image.

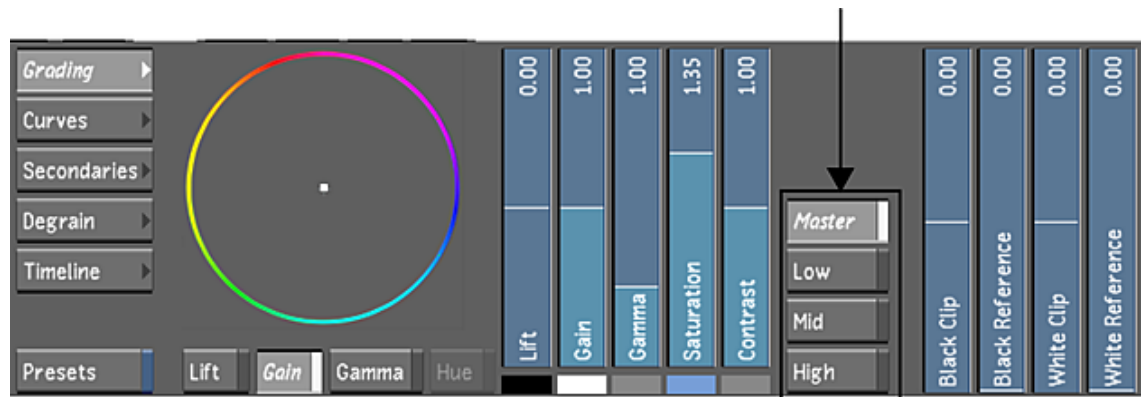
Linear Mode: Modifying Lift

lift, modifying colour valuesLinear mode:modifying liftYou can lift colour values in a selected range or in the entire image, and then offset ranges of colour. Changes in lift mostly affect black level. Although lift affects the entire image or image level, visually, it mostly affects the shadows.

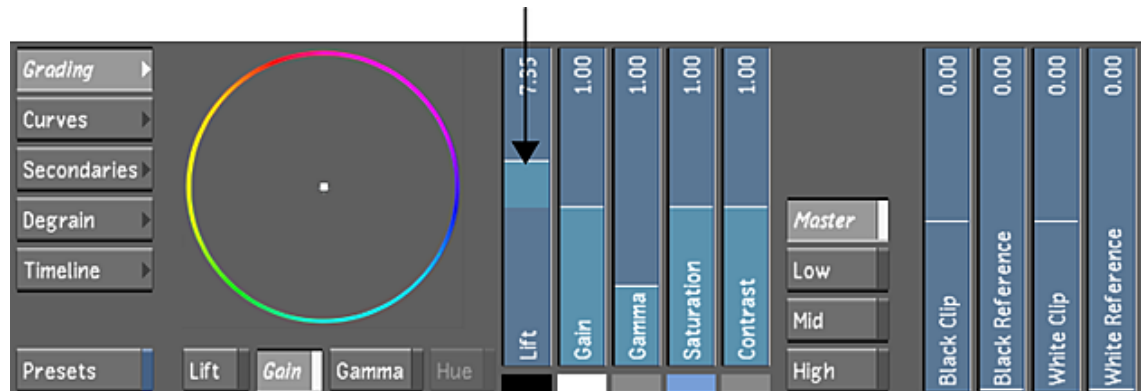
NOTE When you use a slider or colour balance wheel to colour grade a shot, the colour range is limited by the control (the edge of the colour wheel, for example). Use the Autodesk control surface or the Tangent CP100 control surface to reach the full spectrum of colour.

To lift colour values:

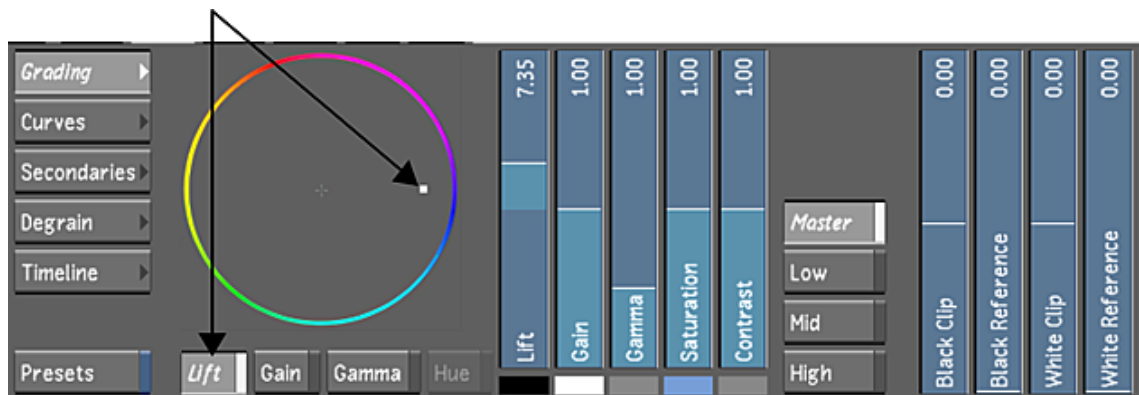
- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Select the image level you want to modify.



- 3 Modify the black levels:
 - To increase the black level, drag the Lift slider up.
 - To decrease the black level, drag the Lift slider down.



- 4 To offset the colours while maintaining the overall luminance, enable Lift and then drag the Lift Balance wheel towards a colour.



The selected colour is lifted while other colours in the image are offset to compensate for the change in luminance.

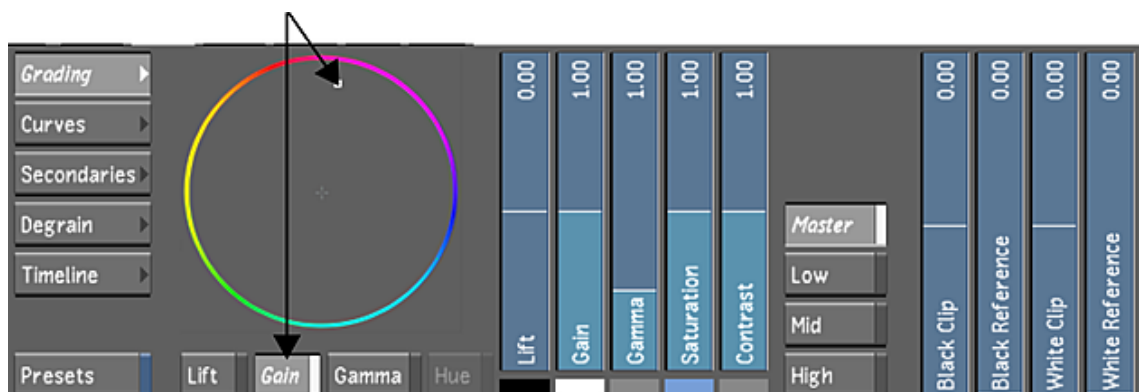
Linear Mode: Modifying Gain

gain, modifyingLinear mode:modifying gainYou can boost image colours in the highlights of the selected range or entire image. Changes in gain mostly affect the highlights and do not change the black point of the image. Gain is similar to brightness in Log mode.

NOTE When you use a slider or colour balance wheel to colour grade a shot, the colour range is limited by the control (the edge of the colour wheel, for example). Use the Autodesk control surface or the Tangent CP100 control surface to reach the full spectrum of colour.

To modify gain:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Select the image level you want to modify.
- 3 Modify the image colours:
 - To increase image colours uniformly, drag the Gain slider up.
 - To decrease image colours uniformly, drag the Gain slider down.
- 4 To offset the colours while maintaining the overall gain, enable Gain and then drag the Gain Balance wheel towards a colour you want to boost.



The selected colour is boosted while other colours in the image are offset to compensate for the change in gain.

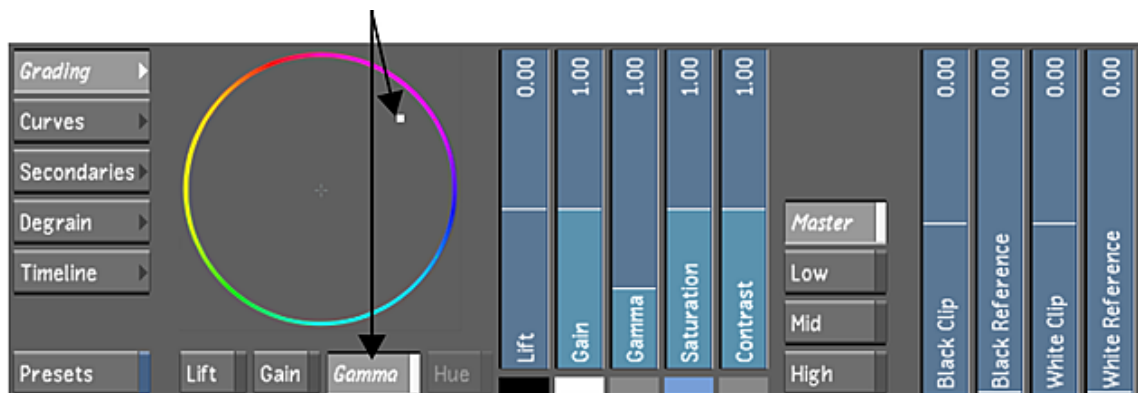
Linear Mode: Modifying Gamma

gamma:modifyingLinear mode:modifying gammaYou can adjust the grey values of an image by adjusting gamma. This allows you to brighten or darken the image and modify the gamma level without greatly affecting the shadows and highlights.

NOTE When you use a slider or colour balance wheel to colour grade a shot, the colour range is limited by the control (the edge of the colour wheel, for example). Use the Autodesk control surface or the Tangent CP100 control surface to reach the full spectrum of colour.

To modify gamma:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Select the range you want to modify.
- 3 Do one of the following:
 - To decrease contrast, drag the Gamma slider up.
 - To increase contrast, drag the Gamma slider down.
- 4 To balance the colours while maintaining the overall gamma level, enable Gamma and then drag the Gamma Balance wheel towards a colour.



The amount of the selected colour is increased in the image while the overall gamma level is maintained. The middle of the image curve is the most affected.

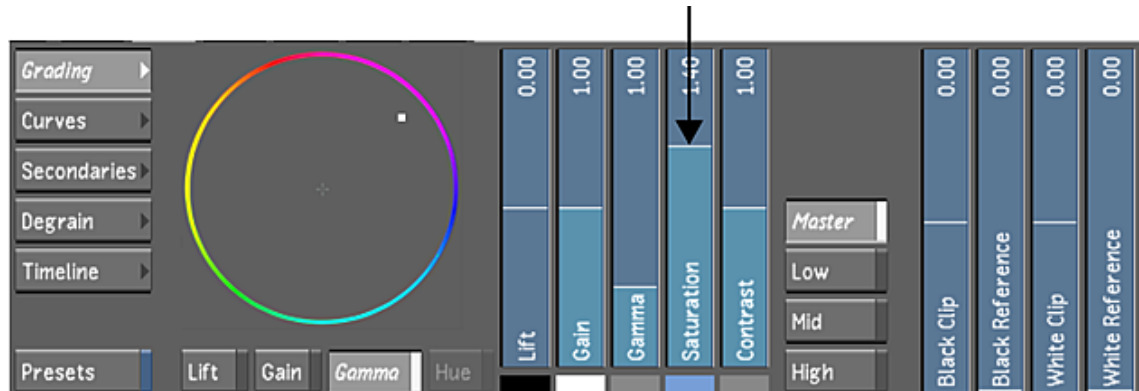
NOTE Select Low, Mid, or High to further differentiate between the areas of the image that are affected.

Linear Mode: Modifying Saturation

saturation:modifying in Linear modeLinear mode:modifying saturationControl the image's colour intensity by modifying the saturation levels.

To modify image saturation:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Modify the image saturation:
 - To increase image saturation, drag the Saturation slider up.
 - To decrease image saturation, drag the Saturation slider down.

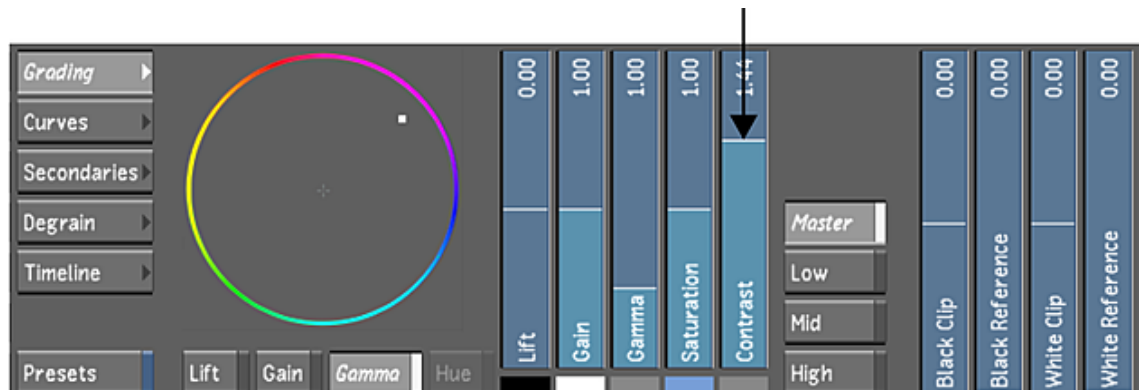


Linear Mode: Modifying Contrast

Linear mode:improving contrastcontrast:modifying in Linear modeAs in Log mode, you can complete the task of balancing the shot's colours by modifying the contrast. With the Contrast slider, you can change the image's Linear luminance curve to a film-contrast-like S curve.

To modify image contrast:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.
- 2 Modify the image contrast:
 - To increase image contrast, drag the Contrast slider up.
 - To decrease image contrast, drag the Contrast slider down.



Linear Mode: Setting Black Clip and White Clip

Linear mode: defining luminance: modifying in Linear mode You can define values to clamp minimum and maximum luminance values using the clip and reference sliders.

To clamp minimum and maximum luminance values:

- 1 Indicate whether this is the initial or final primary grade:
 - To work on the initial primary colour grade, click Input.
 - To make final adjustments to the primary colour grade, click Output.

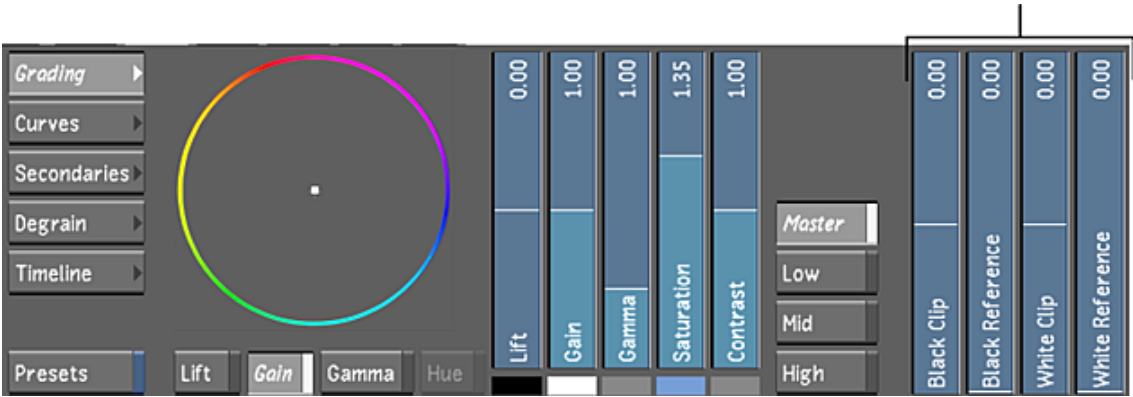
- 2 Modify the clip and reference values using the following sliders.

Black Clip Determines the extent to which values will be smoothed out in the shadows.

Black Reference Defines the range of values in the shadows where the Black Clip will be effective.

White Clip Determines the extent to which values will be smoothed out in the highlights.

White Reference Defines the range of values in the highlights where the White Clip will be effective.



Matching Colours

continuity, matching colours between shots: colours between shots Use the Match feature to match a sample from one shot to other shots to improve continuity between shots in a scene. You can match highlights, shadows, or overall saturation. You can also use Match when you want to match colours such as the colour of the sky or skin tone.

To match colours:

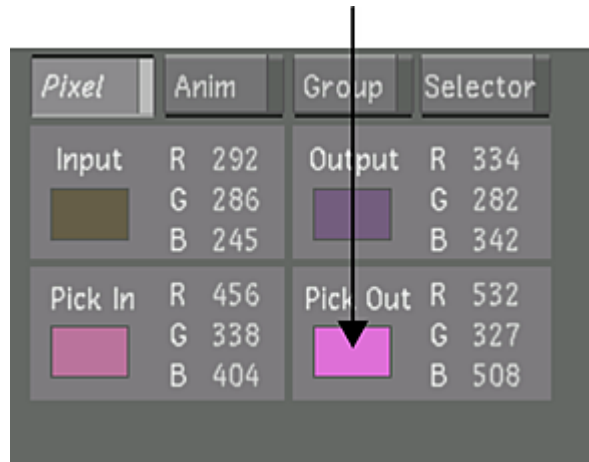
- 1 In the Grading menu, click Input.
- 2 Show the clips you want to match in the Player. Press F3 to display Multi View and then set the number of viewers. See [Setting the Viewing Options](#) (page 332).
- 3 Sample the image you want to use as reference. This is the shot to which other clips are matched. Sample an area that is predominantly black, white, or contains a wide spectrum of colours.

You can:	To:
Click	Sample a single pixel in the image. You can drag through the image until you locate the pixel you want to sample, then click.

You can:	To:
Shift-drag	Sample an average taken from a range of colours in the image.

The sample appears in the Pixel Analyser.

NOTE You can only sample the original image in the viewer. You cannot sample images that are loaded to the frame buffer. In order for sampling to function, geometries cannot be displayed. Be sure to disable the Show button in the Secondaries menu.



- 4 Sample the colours in the shot you want to match. Try to match whites with whites, blacks with blacks, or select a broad range from both images to match saturation.

You can:	To:
Alt-click	Sample an individual pixel and set the Brightness Balance wheel to match the reference sample. You can drag through the image until you locate the pixel you want to sample, then Alt-click.
Shift+Alt-drag	Sample an average taken from a range of colours in the image and set the Brightness Balance wheel to match the reference sample.
Ctrl-click	Sample an individual pixel and set the Brightness Balance wheel and Brightness slider to match the reference sample. You can drag through the image until you locate the pixel you want to sample, then Ctrl-click.
Shift+Ctrl-drag	Sample an average taken from a range of colours in the image and set the Brightness Balance wheel and Brightness slider to match the reference sample.

The sampled colours in the second shot are matched to the reference image.

- 5 Continue matching other shots to the reference image.
- 6 To refine the result, use other controls in the Grading menu and then reuse the Match feature.

Autograding Shots

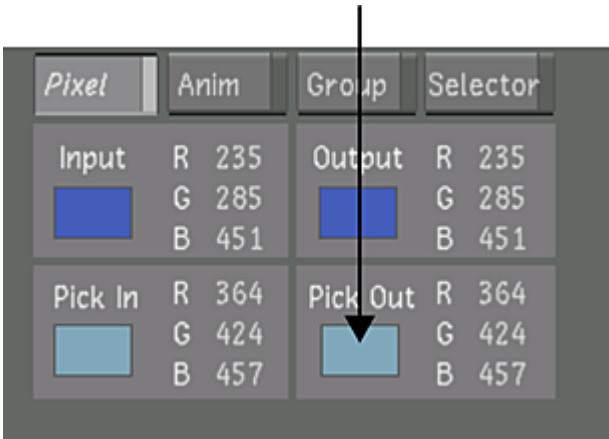
sampling, pixels for autogradingautograding, shots based on sampled pixelsFrom the Grading menu, you can automatically colour grade a shot based on sampled pixels. Autograding balances the colours according to the Brightness Balance wheel—the sampled pixels are changed to a more neutral colour. For example, if you sample an area that contains more blue than any other colour, yellow (the colour that is opposite on the colour wheel) is added to the image. To properly autograde a shot, sample an area of the image that should be neutral or have no hue cast. Sample blacks, whites, or greys.

To autograde a shot:

- 1 Sample an area of the image that should be neutral.

You can:	To:
Click	Sample a single pixel in the image. You can drag through the image until you locate the pixel you want to sample, then click.
Shift-drag	Sample an average taken from a range of colours in the image.

The sample appears in the Pixel Analyser.



- 2 Press / (forward slash).
The entire image is autograded according to the sample. The colours are rebalanced as shown on the Brightness Balance wheel.

Colour Grading RGB and Hue Curves

20

curves:colour gradingcolour grading:curves gradingWhen you want to colour grade a specific range of colour without generating a key, you can modify the RGB and Hue curves. The RGB curves are inserted in the processing pipeline in two places—after the initial primary colour grade and after the addition of any Sparks effects. Sparks are inserted after secondary colour grading. The Hue curves are inserted in the processing pipeline in one place—after the initial primary colour grade. RGB and Hue curves can also be applied to secondary colour grades.

The RGB curves consist of red, green, blue, and RGB curves. Modify these curves when you want to remap colour values for the red, green, and blue channels individually or together. The Hue curves consist of Hue, Lightness, Saturation, and Luminance curves. Modify these curves when you want to perform hue shifts, lighten colours in the image, and suppress or saturate a particular range of colour or luminance area.

You can also plot colours and add vertices to the curves so that you can remap any value in the colour range precisely.

For information on secondary colour grading, see [Secondary Colour Grading](#) (page 443). The Luminance curve can only be modified on the Curves menu.

TIP For faster playback on shots with input RGB and Hue curve modifications, enable GPU processing by clicking the GPU button. See [GPU Acceleration](#) (page 400).

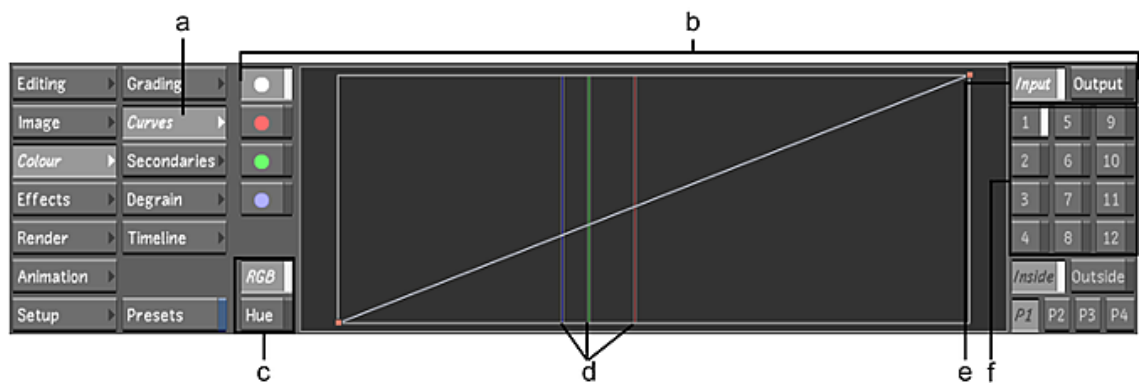
Accessing the Curves Menu

Use the Curves menu to modify RGB and Hue curves.

To access the Curves menu:

- 1 Do one of the following:
 - In the Main menu, click Colour and then Curves.
 - Press F7. See [Displaying Colour Menus in the Player](#) (page 398).

The Curves menu appears.



(a) Curves button (b) Curves menu (c) RGB and Hue curve buttons (d) Sampled colour values (e) Input and Output buttons (f) Secondary layers

- 2 Enable one of the following buttons.

Input Enables RGB and Hue curve modification for primary colour grading performed prior to secondary colour grading.

Output Enables RGB curve modification for primary colour grading performed after secondary colour grading and the creation of Sparks effects.

Secondary layer Enables a layer for RGB and Hue curve modification for secondary colour grading.

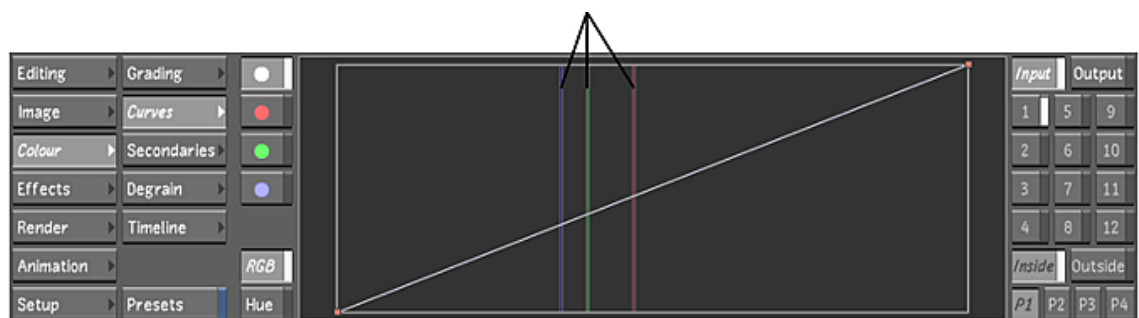
NOTE Hue curves are not functional when the Output button is enabled.

Plotting Colour Values when Adjusting Curves

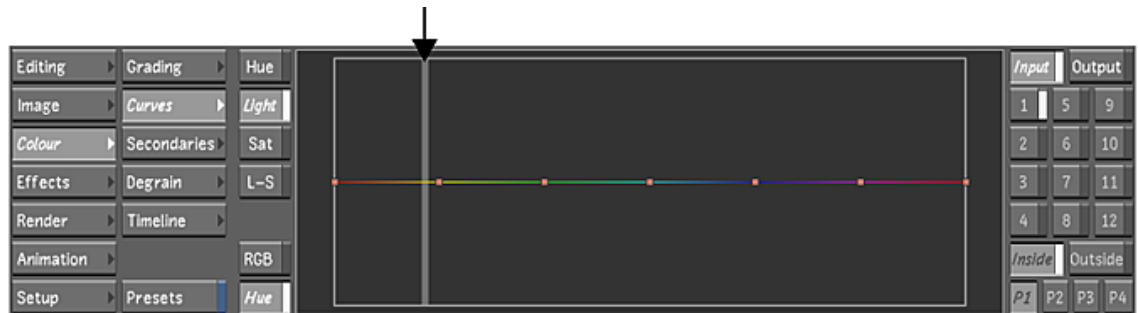
plotting, sampled colour valuescurves:plotting colour valuesPlot the colour value of any sample on RGB and Hue curves. While you make adjustments, you can plot colours as often as necessary to isolate the colours you want to modify.

To plot colour values when adjusting curves:

- 1 Indicate the colour grading stage at which the curve modification is being applied:
 - To work on the initial primary grade, click Input.
 - To make final adjustments to the primary grade, click Output.
 - To make curve modifications for secondary colour grading, enable a secondary layer.
- 2 In the Player, sample the colour you want to use as reference. Click the image to sample a single pixel. You can drag through the image until you locate the pixel you want to sample, and then click. On the RGB curve, red, green, and blue vertical lines appear, representing the red, green, and blue colour channels.



On the Hue curves, a single vertical line appears, representing the colour on the hue spectrum.



- 3 To zoom in on a curve using rectangle zoom, drag a selection box around the desired area while pressing **Alt**, and then release the mouse.

The area of the curves contained by the selection box now occupies the entire Curve canvas.

- 4 To zoom in on a curve using proportional zoom, press **Alt** while dragging right or left with the right mouse button.

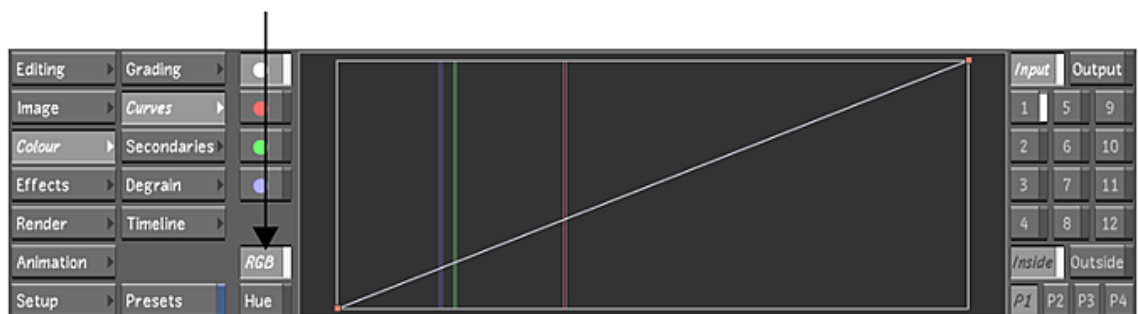
The aspect ratio of the Curve canvas is maintained while zooming in and out.

Modifying Red, Green, and Blue Channels

RGB channels, adjusting individually with curves. Modify the RGB, red, green, or blue curves to fine-tune the colour grade. When you modify the RGB curve, the red, green, and blue channels are adjusted equally. When you modify the red, green, or blue curve, only the selected colour channel is adjusted. You can add vertices to a curve to refine your adjustments.

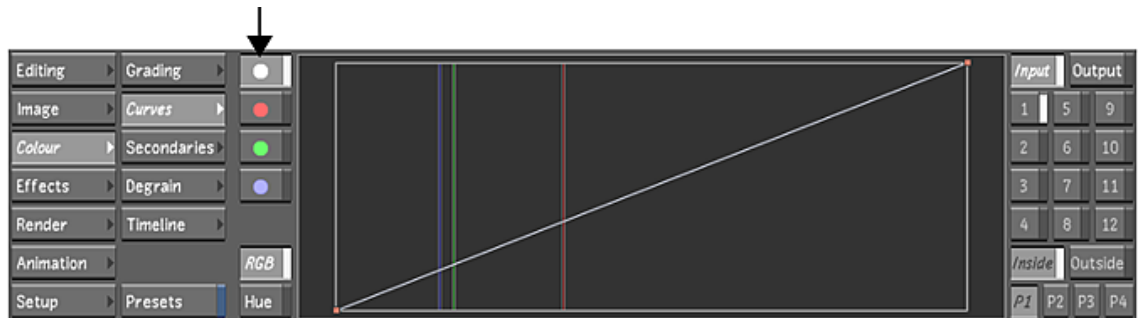
To modify the red, green, blue, or RGB curve:

- 1 Indicate the colour grading stage at which the curve modification is being applied:
 - To work on the initial primary grade, click **Input**.
 - To make final adjustments to the primary grade, click **Output**.
 - To make curve modifications for secondary colour grading, enable a secondary layer.
- 2 Click **RGB** to display the RGB curves.

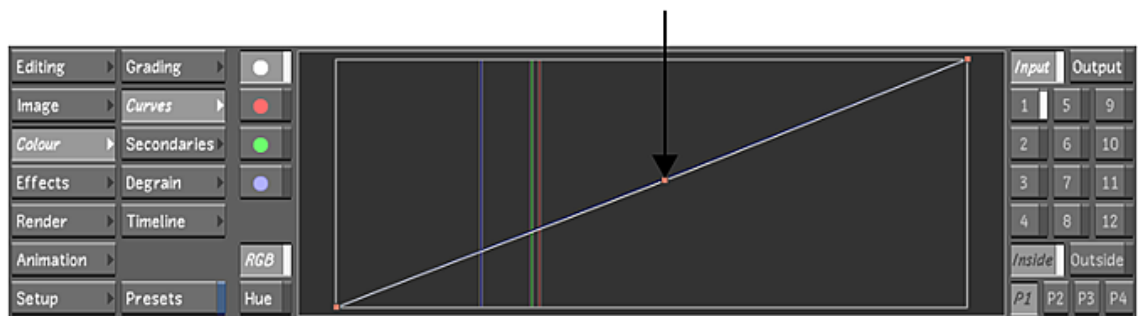


- 3 Show the curve you want to modify by clicking the button corresponding to the colour of the curve. The selected curve is highlighted.

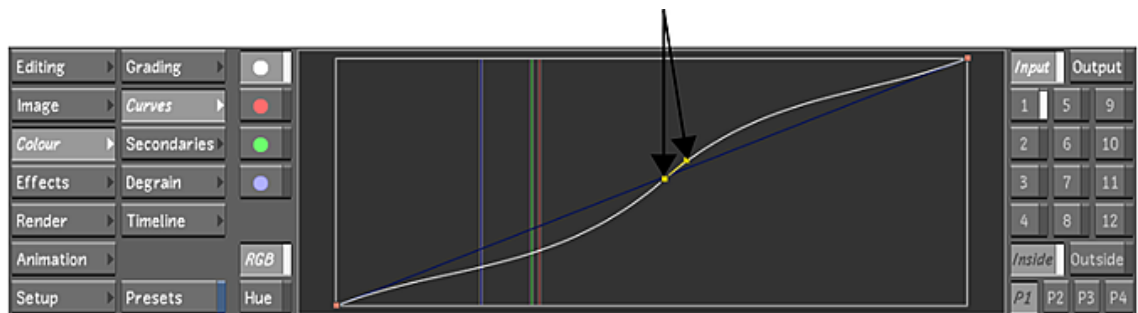
NOTE To display the RGB curve, click the white button.



- 4 Sample the colour you want to use as a reference for your adjustments. See [Plotting Colour Values when Adjusting Curves](#) (page 434).
Red, green, and blue vertical lines representing the colour channels are plotted on the curve.
- 5 To add a vertex to the curve, place the mouse cursor over the area on the curve where you want to add the vertex and press A. To lock the curve in place while adding a vertex, press Shift+A on the curve.



- 6 Click a vertex to display its tangent handle and then drag the handle to adjust the curve. You can also adjust the curve by dragging the vertex.



- 7 Modify the curve until you are satisfied with the results:
 - To select a vertex, click it. To select several vertices, draw a selection box around them.
 - To move one or several selected vertices, drag a selected vertex. To restrict vertex movement to the Y axis, press Shift while moving the mouse. To restrict vertex movement to the X axis, press Shift+Alt while moving the mouse.
 - To delete vertices, select them and then press D.

Modifying Hue, Saturation, Luminance, and Lightness

Modify curves to adjust the hue, saturation, luminance, and lightness of an image. You can:

- Perform hue shifts.

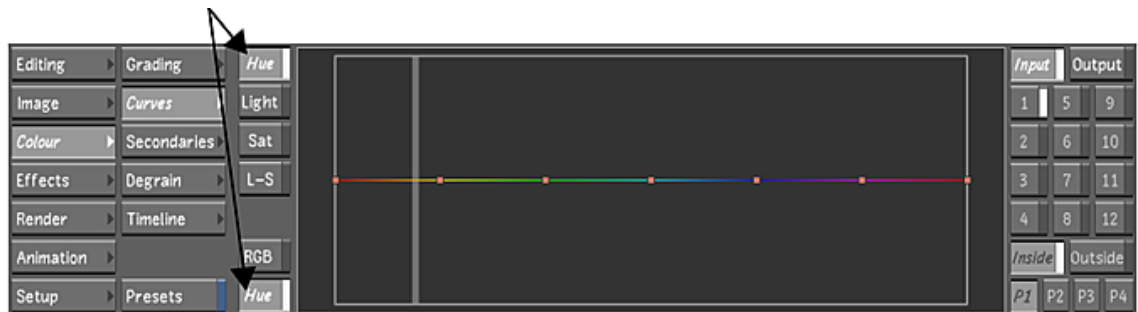
- Suppress or saturate colour ranges.
- Suppress or saturate luminance ranges.
- Lighten or darken colour ranges.
- Add vertices to the curves to refine your adjustments.

Shifting Hue

hues:shifting with curvescurves:shifting hueShift the hue of the entire image or a range of colour in the image.

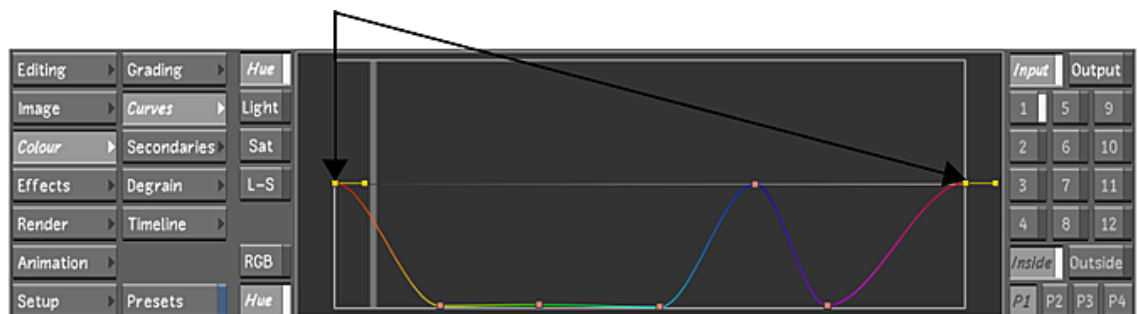
To perform a hue shift:

- 1 Indicate the colour grading stage at which the curve modification is being applied:
 - To work on the initial primary grade, click Input.
 - To make curve modifications for secondary colour grading, enable a secondary layer.
- 2 Click the Hue button located below the RGB button, and then click the upper Hue button to display the Hue curve.



The Hue curve is plotted to the Hue spectrum.

- 3 Sample the colour you want to use as a reference for your adjustments. See [Plotting Colour Values when Adjusting Curves](#) (page 434).
A vertical line representing the reference colour is plotted on the Hue curve.
- 4 Drag vertices up or down to shift the hue of the colour displayed in the hue spectrum.



The hue of the selected colours moves through the hue spectrum as you drag.

TIP You can also select a vertex to use tangent handles to adjust the curve.

- 5 Modify the curve until you are satisfied with the results:
 - To select a vertex, click it. To select several vertices, draw a selection box around them.

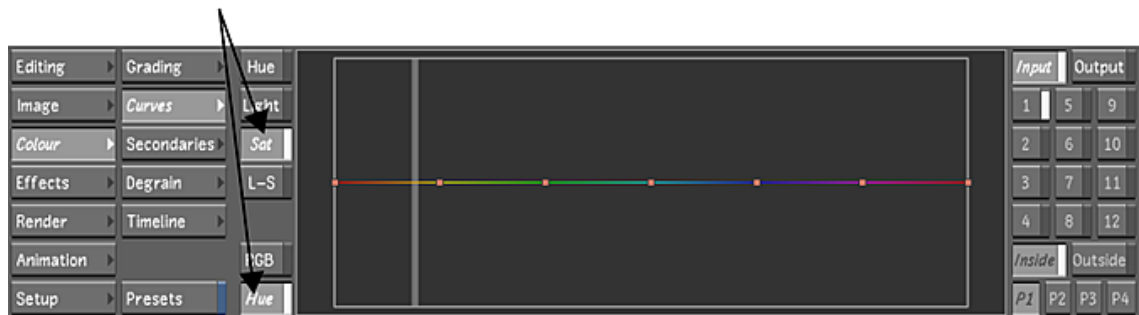
- To move several selected vertices, select them and then drag one. To restrict vertex movement to the Y axis, press **Shift** while moving the mouse. To restrict vertex movement to the X axis, press **Shift+Alt**.
- To add a vertex to the curve, place the mouse cursor over the area on the curve where you want to add the vertex and then press **A**.
- To lock the curve in place while adding a vertex, press **Shift+A** on the curve.
- To delete vertices, select them and then press **D**.

Saturating and Suppressing Colours

saturation:adjusting with curvescurves:adjusting saturationYou can adjust the purity of colours in the image by modifying the saturation. You can suppress or saturate colours in a range or across the entire image.

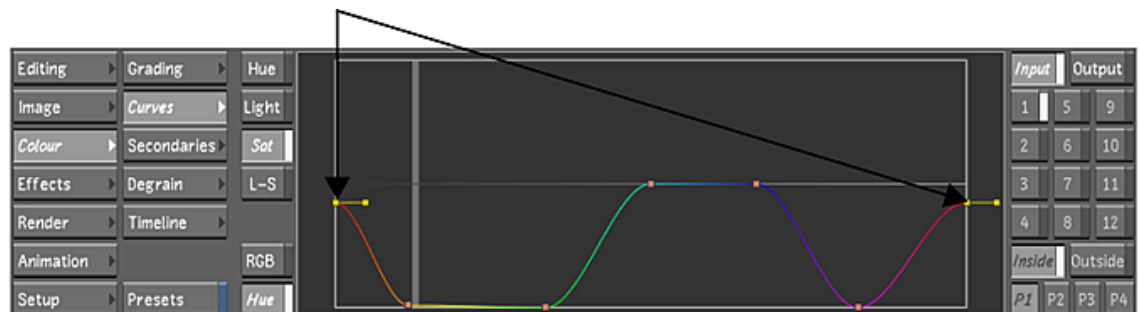
To saturate and suppress colours in the image:

- 1 Indicate the colour grading stage at which the curve modification is being applied:
 - To work on the initial primary grade, click **Input**.
 - To make curve modifications for secondary colour grading, enable a secondary layer.
- 2 Click **Hue** and then click **Sat** to display the Saturation curve.



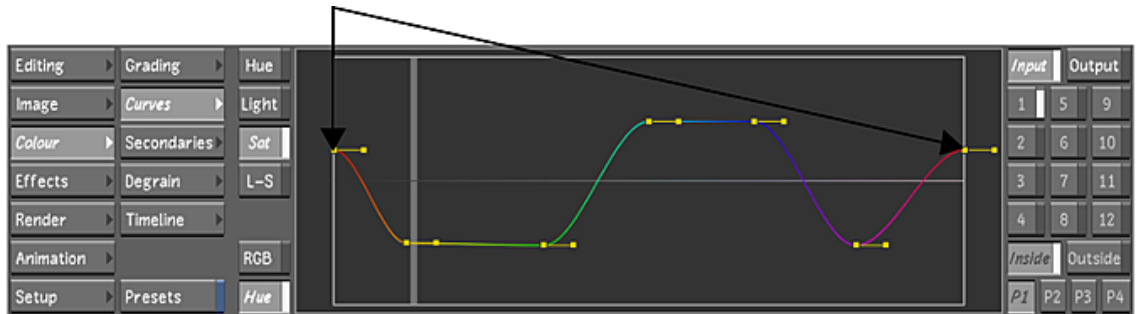
The Saturation curve is plotted to the hue spectrum.

- 3 Sample the colours you want to use as a reference for your adjustments. See [Plotting Colour Values when Adjusting Curves](#) (page 434).
A vertical line representing the reference colour is plotted on the Saturation curve.
- 4 To select a vertex, click it. To select several vertices, draw a selection box around them.
- 5 Saturate or suppress the colour:
 - To saturate the colour displayed in the hue spectrum, drag selected vertices up.
 - To suppress the colour displayed in the hue spectrum, drag selected vertices down.



TIP You can also select a vertex to use tangent handles to adjust the curve.

- 6 To move several selected vertices, select them and then drag one. To restrict vertex movement to the Y axis, press **Shift** while moving the mouse. To restrict vertex movement to the X axis, press **Shift+Alt**.



TIP To create a greyscale image, select all the vertices and then drag them all the way down. You can then drag vertices up to saturate isolated ranges of colour.

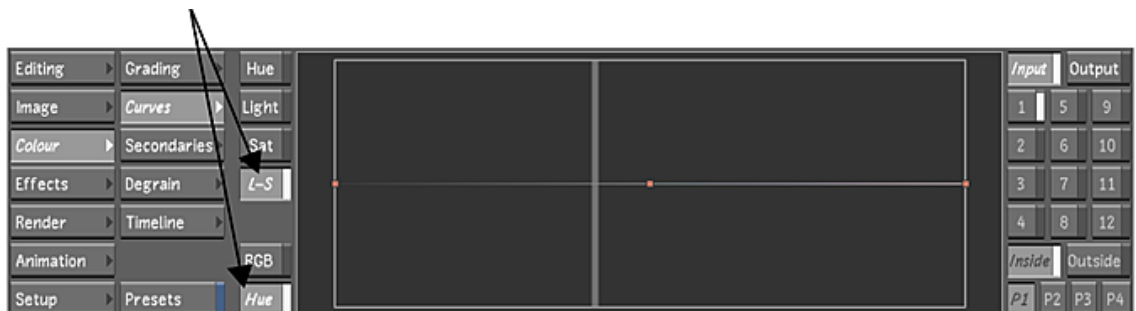
- 7 To add a vertex to the curve, place the mouse cursor over the area on the curve where you want to add the vertex and then press **A**. To lock the curve in place while adding a vertex, press **Shift+A** on the curve.
- 8 To delete vertices, select them and then press **D**.
- 9 Edit the curve until you are satisfied with the results.

Modifying Image Luminance

luminance:modifying using the Luminance curvecurves:modifying luminanceThe Luminance curve represents the gamut of light from black to white. Use the Luminance curve to saturate or desaturate different luminance areas by adding or removing hue from black and white points. Like any other curve, you can add points to refine ranges of an effect.

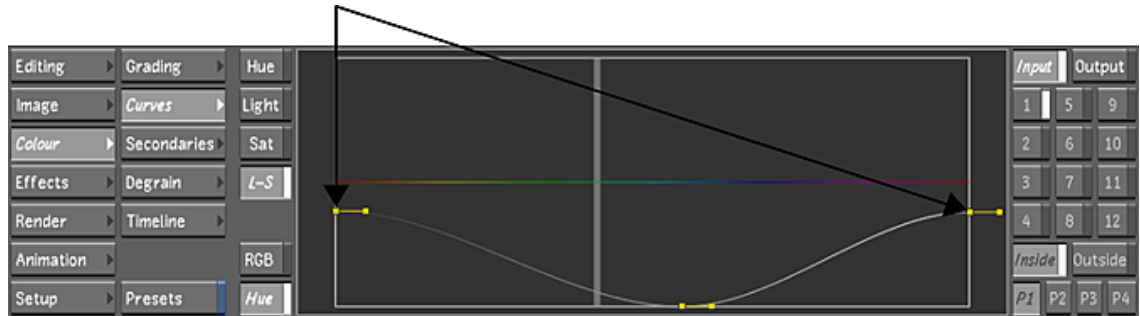
To suppress or saturate luminance areas in the image:

- 1 Indicate the colour grading stage at which the curve modification is being applied:
 - To work on the initial primary grade, click **Input**.
 - To make curve modifications for secondary colour grading, enable a secondary layer.
- 2 Click **Hue** and then click **L-S** to display the Luminance curve.



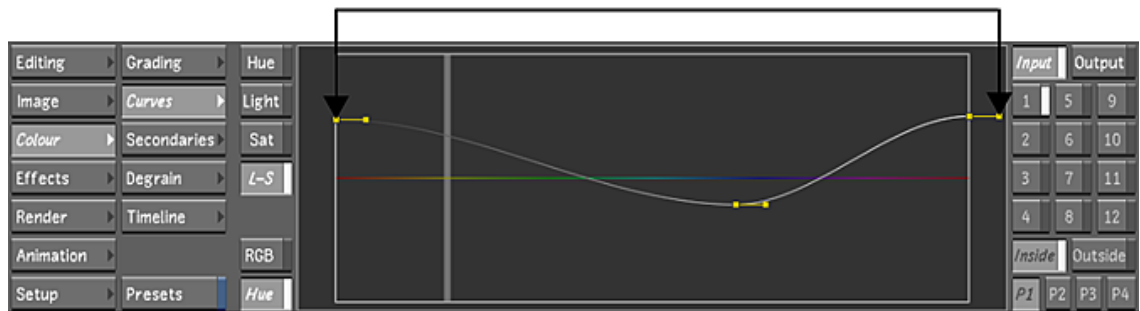
The Luminance curve is plotted to the hue spectrum.

- 3 Sample the luminance areas you want to use as a reference for your adjustments. See [Plotting Colour Values when Adjusting Curves](#) (page 434).
A vertical line representing the reference colour is plotted on the Luminance curve.
- 4 To select a vertex, click it. To select several vertices, draw a selection box around them.
- 5 Saturate or suppress the luminance area:
 - To saturate the luminance area displayed in the hue spectrum, drag selected vertices up.
 - To suppress the luminance area displayed in the hue spectrum, drag selected vertices down.



TIP You can also select a vertex to use tangent handles to adjust the curve.

- 6 To move several selected vertices, select them and then drag one. To restrict vertex movement to the Y axis, press **Shift** while moving the mouse. To restrict vertex movement to the X axis, press **Shift+Alt**.



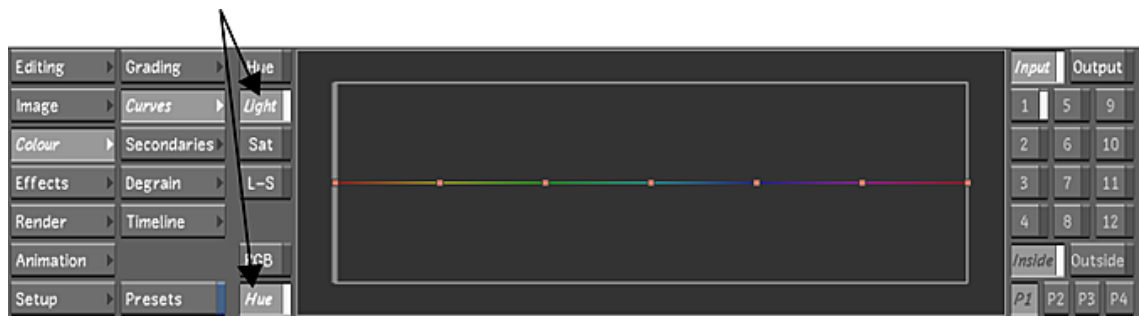
- 7 To add a vertex to the curve, place the cursor over the area on the curve where you want to add the vertex and then press **A**. To lock the curve in place while adding a vertex, press **Shift+A** on the curve.
- 8 To delete vertices, select them and then press **D**.
- 9 Edit the curve until you are satisfied with the results.

Modifying Image Lightness

lightness, modifying using the Lightness curvecurves:modifying lightnessIncrease or decrease the lightness in specific colour ranges or across the image.

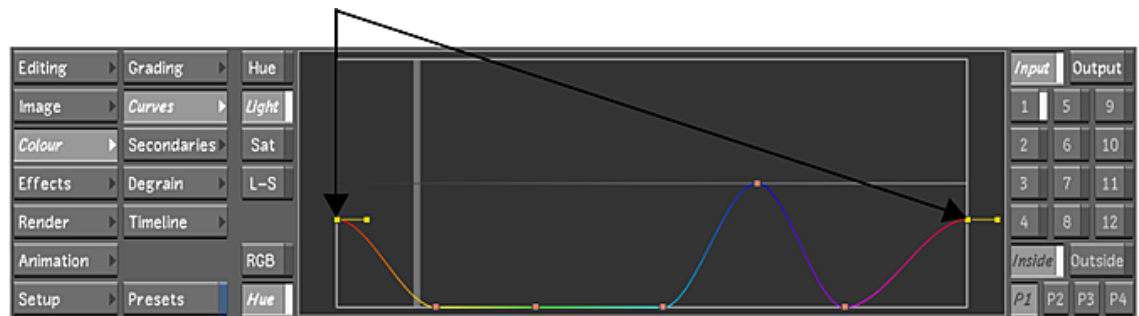
To modify image lightness:

- 1 Indicate the colour grading stage at which the curve modification is being applied:
 - To work on the initial primary grade, click **Input**.
 - To make curve modifications for secondary colour grading, enable a secondary layer.
- 2 Click **Hue** and then click **Light** to display the Lightness curve.



The Lightness curve is plotted to the hue spectrum.

- 3 Sample the colours you want to use as a reference for your adjustments.
A vertical line representing the reference colour is plotted on the Lightness curve.
- 4 To select a vertex, click it. To select several vertices, draw a selection box around them.
- 5 Modify the lightness:
 - To increase the lightness of the colour displayed in the hue spectrum, drag selected vertices up.
 - To decrease the lightness of the colour displayed in the hue spectrum, drag selected vertices down.



TIP You can also select a vertex to use tangent handles to adjust the curve.

- 6 To move several selected vertices, select them and then drag one. To restrict vertex movement to the Y axis, press **Shift** while moving the mouse. To restrict vertex movement to the X axis, press **Shift+Alt**.
- 7 To add a vertex to the curve, place the cursor over the area on the curve where you want to add the vertex and then press **A**. To lock the curve in place while adding a vertex, press **Shift+A** on the curve.
- 8 To delete vertices, select them and then press **D**.
- 9 Edit the curve until you are satisfied with the results.

Secondary Colour Grading

21

selective colour grading. See secondary colour grading overview. In Lustre, you perform secondary colour grading on shots. With secondary colour grading, you isolate and then colour grade colour ranges and objects in your shots. Secondaries are defined by a combination of keys and geometries—keys to isolate colours and geometries to isolate objects or areas in the image. To colour grade an object that moves through time, you can animate the associated geometry using trackers.

NOTE Trackers are used for precise secondary animation; however, when a tracker is not required, keyframes are predominantly used to animate secondaries.

Secondary colour grading is done in the middle of the colour grading process—after the first modifications you make to RGB and Hue curves and before applying Sparks. In Log mode, you can modify brightness, contrast, and hue. In Linear mode, you can modify lift, gain, gamma, and hue.

NOTE If you create effects for your image using Sparks, they are processed after secondary colour grading. See [Creating Lustre Sparks Effects](#) (page 525).

You can create and colour grade up to 48 unique secondary layers for each shot. However, you can toggle the secondary layers on and off and view the results in the Player. You can save key presets, geometry presets, and de grain presets. You can also import garbage mask setups, tracker data, and stabilizer data from other Autodesk products.

Secondaries are included in the processing pipeline. With the Geom button activated, you can use the colour grading controls in the Grading menu to perform secondary colour grading to the area defined by the key and geometry.

TIP GPU acceleration makes faster playback available for certain secondary grading features. See [GPU Acceleration](#) (page 400).

NOTE The histogram, waveform, and vectorscope monitors do not dynamically update when GPU acceleration is enabled. They retain the colour distribution of the image prior to GPU acceleration being enabled. See [Viewing Colour Distribution](#) (page 405).

Accessing Secondary Grading Menus

secondary colour grading:accessing grading menus. You perform secondary colour grading with the Secondaries and Grading menus.

To access the menus for secondary colour grading:

- 1 Do one of the following:
 - In the Main menu, click Colour.
 - Press F7. See [Displaying Colour Menus in the Player](#) (page 398).

The Colour menu appears.



- 2 Click one of the following buttons.

Secondaries Displays the Secondaries menu, where you have access to the geometry, keyer, presets, secondary layers, and tracker panels. See [The Secondaries Menu](#) (page 444).

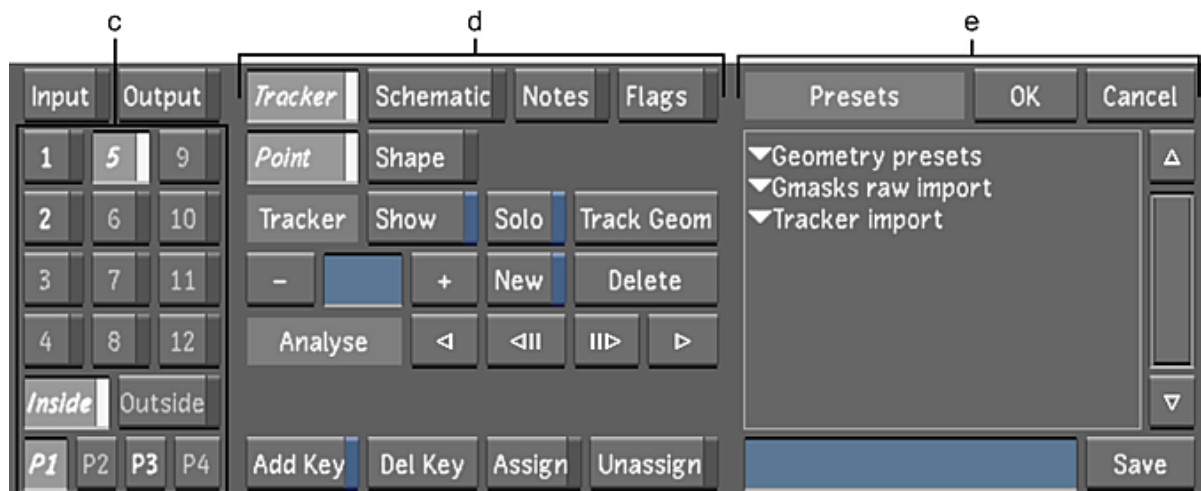
Grading Displays the Grading menu. Once geometries have been created, use the Grading menu for secondary colour grading. In Log mode, make adjustments to brightness, contrast, saturation, and hue. In Linear mode, make adjustments to lift, gain, hue, gamma, and saturation. Use logical operations to link geometries across secondaries. See [Primary Colour Grading](#) (page 415).

NOTE You can also modify RGB and Hue curves for secondaries using the Curves menu. For information, see [Colour Grading RGB and Hue Curves](#) (page 433).

The Secondaries Menu

The Secondaries menu allows you to create and track geometries to isolate objects or areas within the shot, and create keys to isolate ranges of colour. You are then able to use logical operations to link geometries across secondaries. The following is a breakdown of the Secondaries menu.





(a) Geometry panel (b) HLS and Diamond Keyer panel (c) Secondary Layers panel (d) Shape and Point Tracker panel (e) Presets panel

Geometry panel Creates geometries of various shapes in order to isolate objects or areas within a shot. Once a geometry has been graded, you can modify the softness, colour, opacity, and blur of the geometry to acquire a certain effect. See [About Geometries](#) (page 451).

HLS and Diamond Keyer panel Extracts a key to isolate a colour within your shot. See [Creating a Secondary by Keying a Range of Colours](#) (page 477).

Secondary Layers panel Creates up to 48 layers of secondary grading for each shot. See [Secondary Layers](#) (page 445).

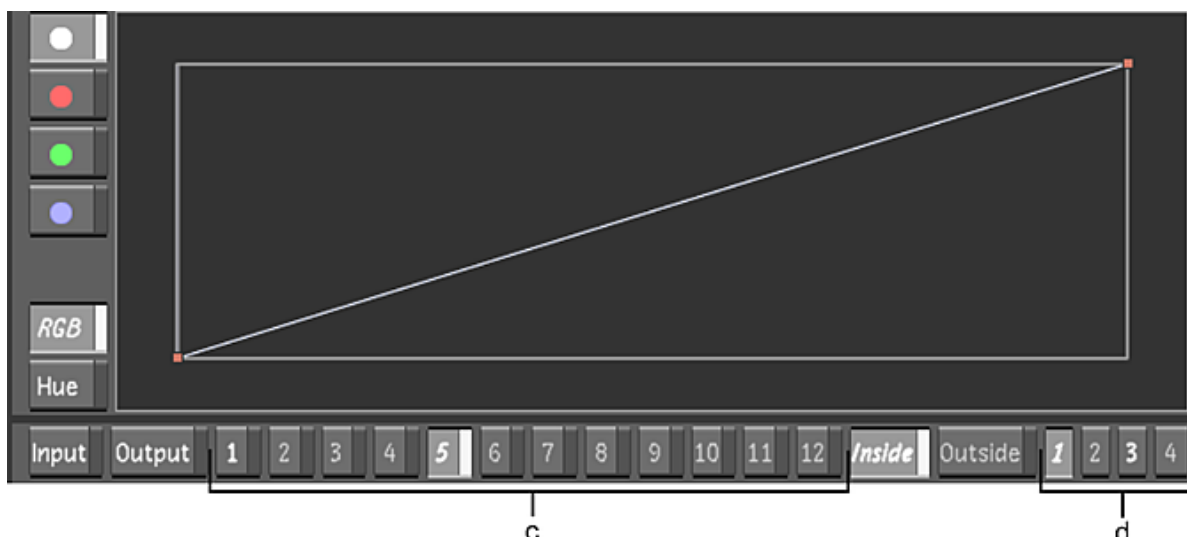
Shape and Point Tracker panel Tracks either objects or points throughout a shot. See [Shape Tracker](#) (page 501) and [Animating the Point Tracker](#) (page 506).

Presets panel Lists the previously saved geometry, gmask raw, tracker, and key presets that allows you to increase the efficiency and speed of the colour grading process. See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

Secondary Layers

secondary layers The secondary layers panel allows you to create up to 48 secondaries to be applied to each shot in your project. Once a secondary layer is selected, you can choose whether or not to apply the grading changes to the shot.





(a) Secondary layers (b) Secondary layer pages (c) Secondary layers within the F7 mode (d) Secondary layer pages within the F7 mode

Secondary Layer buttons There are 48 secondary layers that can be used to contain your secondary grading information. When a layer is selected, you are able to modify the grading applied to that layer. When a layer is activated, the grading is applied to the shot and is visible within the Player. Only one layer can be selected for editing at one time, but you can activate up to 48 layers at one time. There are 12 secondary layers on each page and there are four pages of secondary layers.

Inside button When selected, the secondary grading is applied inside the geometry. This is the default. In order to view the grading, make sure the button is activated (i.e., the text is white). If not, right-click the button to activate it. See [Colour Grading Inside and Outside Secondaries](#) (page 450).

Outside button When selected, the secondary grading is applied outside of the geometry. In order to view the grading, make sure the button is activated (i.e., the text is white). If not, right-click the button to activate it. See [Colour Grading Inside and Outside Secondaries](#) (page 450).

Secondary Layer Page buttons When a page is selected, it displays the 12 secondary layers associated with that page (e.g. P1 displays layers 1-12, P2 displays layers 13-24, etc.). If a page number is highlighted but not selected, it lets you know that there are active secondary layers on that page.

Secondary Layer Hotkeys

secondary layers:hotkeysThe following is a list of the secondary layer hotkeys. Refer to the Autodesk Control Surface User Guide [Adding Secondary Layers](#) (page 854) for a list of the control panel hotkeys. These hotkeys can be used wherever the secondary layer panel is visible on the user interface.

NOTE These hotkeys cannot be used with the secondary option within the Effects menu.

Press:	To:
1 to 0, -, =	Select a secondary layer (1-12, 13-24, 25-36, or 37-48).
\	Activate/deactivate the selected secondary layer.
Ctrl+(1, 2, 3, or 4)	Select the secondary layers page 1, 2, 3, or 4.

Press:	To:
Scroll Lock	Cycle through all the activated secondary layers.
Ctrl-click secondary layer button	Copy the grading information from the current menu (e.g., Grading, Curves, or Secondaries) to the selected secondary layer.
Shift-click secondary layer button	Copy all the colour grading information to the selected secondary layer.

Selecting and Activating Secondary Layers

secondary layers:selecting and activatingWhen a secondary layer is selected, you can edit that layer. You can then toggle the activation of the secondary layer and view the results in the Player. Only one layer can be selected at a time for editing, but up to 48 layers can be activated and displayed within the Player.

To select and activate a secondary layer:

- 1 Click the layer number button. The grey bar on the side changes colour to show that a layer has been selected.

NOTE Click on another layer number to select another layer to edit.

- 2 Right-click the selected layer number to activate it. The number on the secondary button becomes white and all the changes applied to that layer are now visible within the Player.
To deactivate the layer, right-click the layer number button again. The number on the secondary button goes from white to grey to indicate that it is no longer activated. The layer is then bypassed in the processing pipeline.

NOTE If you do not activate the layer, you can manipulate the geometry while keeping the colour correction hidden.



(a) Selected and activated secondary layer (b) Activated and unselected secondary layer (c) Current secondary layer page with activated layer(s) (d) Secondary layer page with activated layer(s)

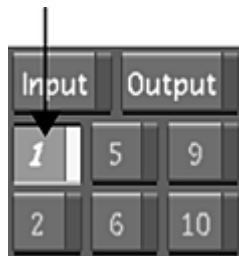
Colour Grading Secondaries

colour grading:secondary gradingsecondary colour grading:performing colour gradingUse the colour grading controls in the Grading menu to perform secondary colour grading on your shots. Once the layer has been selected in the Secondaries menu, switch to the Grading menu and perform secondary grading, either in Logarithmic or Linear mode, just as you would for a primary grade.



To perform secondary colour grading:

- 1 In the Secondaries menu, right-click a secondary layer to activate it.



- 2 Define the area to be selectively colour graded by creating a key, adding one or more geometries, or combining a key with one or more geometries. See [About Geometries](#) (page 451) and [Creating a Secondary by Keying a Range of Colours](#) (page 477).

If you are colour grading geometries, enable Geom. This ensures that the colour correction will be applied selectively, rather than to the whole image.



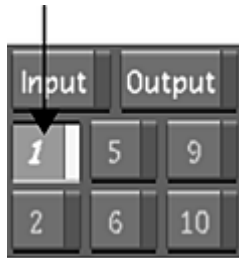
- 3 Click Grading to display the Grading menu.
- 4 Perform colour grading as you would for a primary grade. See [Primary Colour Grading](#) (page 415).

Shifting Hue

hues:shifting for secondariessecondary colour grading:shifting hueYou can shift the hue of the area defined by a secondary using the Hue Rotator.

To shift the hue:

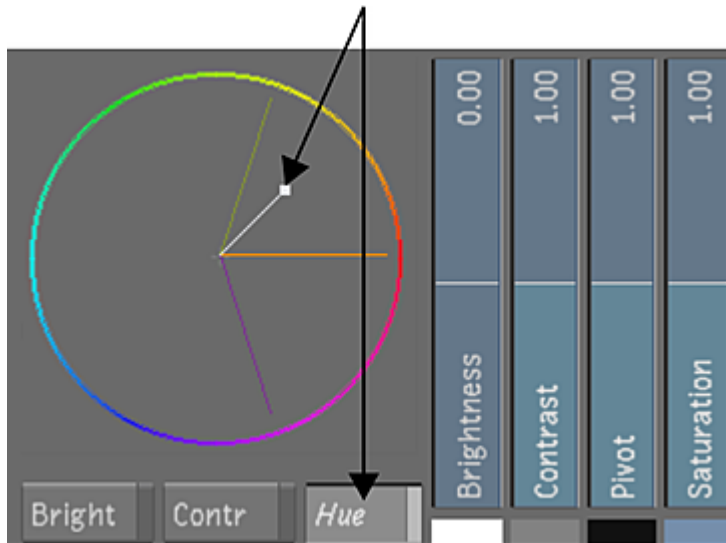
- 1 In the Secondaries menu, right-click a secondary layer to activate it.



- 2 Define the area to be selectively colour graded by creating a key, adding one or more geometries, or combining a key with one or more geometries.
- 3 If you are colour grading geometries, enable Geom. This ensures that the colour correction will be applied selectively, rather than to the whole image.



- 4 Click Grading to display the Grading menu.
- 5 Click Hue and then drag the Hue Rotator to shift the hue. To shift the hue clockwise through the hue spectrum, drag right. To shift the hue counter-clockwise, drag left.



Adjusting Printer Lights for Secondary Grading

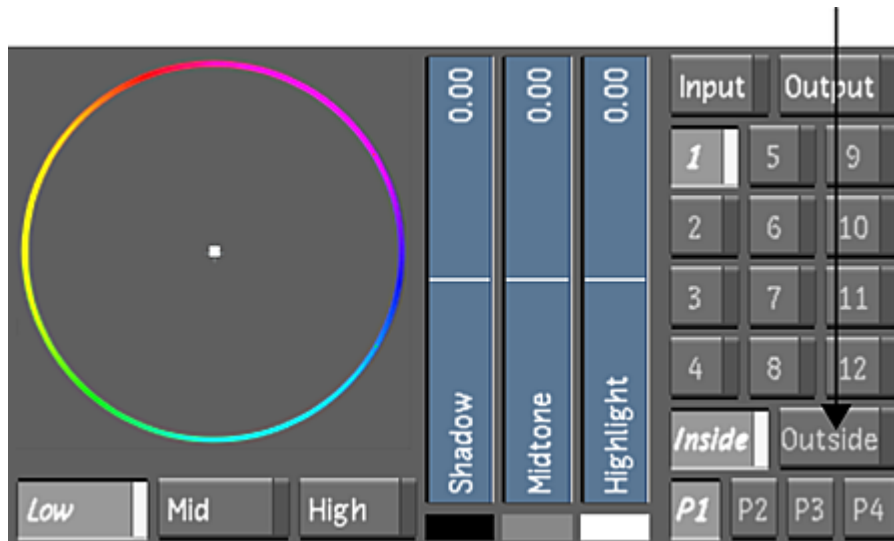
printer lights:adjusting for secondariessecondary colour grading:adjusting printer lightsYou can make printer light adjustments to secondaries just as you would to primary colour grades. See [Adjusting Printer Lights for Primary Grading](#) (page 418).

Colour Grading Inside and Outside Secondaries

geometries:grading inside and outsidesecondary colour grading:grading outside the secondarySecondaries can have unique colour grades applied both inside and outside a defined shape. The secondary's default state is the inside.

To grade a secondary and its surrounding area:

- 1 Colour grade the secondary.
- 2 In the secondary layers panel, click Outside to switch out of inside colour grading mode.



- 3 Right-click Outside to activate the outside colour grading mode.

NOTE Selecting Inside or Outside allows you to colour grade the inside or outside area of the secondary. If you do not activate either button, its colour grade will be hidden in the Player.

If gradients are used to define the shape, the appropriate blend will be applied between the shapes.

Copying Shapes and Grades

geometries:copying shapes and gradescopying:shapes and gradesYou can speed up the secondary colour grading process by copying a shape, or a shape with its parameters, from one secondary to another. This functionality is useful when colour grading the same shape(s) across several secondaries.

To copy a shape from one secondary to another:

- 1 Click Secondaries to display the Secondaries menu.
- 2 In the Player, select the shape's axis.

- 3 Hold down the `Ctrl` key while clicking a new secondary.
The new secondary is enabled and the shape appears in the same position as on the previous secondary.

To copy a shape and selected parameters from one secondary to another:

- 1 Click Secondaries to display the Secondaries menu.
- 2 In the Player, select the shape's axis.
- 3 Click Selector and choose the parameters to be copied.
- 4 `Shift`-click the new secondary.
The new secondary is enabled and the shape with its parameters appears in the same position as on the previous secondary.

Applying a Secondary Colour Grade to the Entire Image

primary colour grading:applying secondaries tosecondary colour grading:applying to the entire imageOnce a secondary has been graded, you can test how the secondary grade would look like as a primary grade.

To view a secondary's colour grading as a primary colour grade:

- 1 In the Secondaries menu, deactivate Geom and the keyer.



NOTE To reapply the secondary colour grade, enable the Geom button again.

About Geometries

geometries:creatingsecondary colour grading:creating geometriesGeometries are spline-based objects you draw directly on a shot or an image. When performing secondary colour grading, you can create geometries to isolate particular objects or areas in the image to include with, or exclude from, the secondary colour grade.

You can include multiple geometries with each secondary.

Once geometries have been added, you can:

- Resize, reposition, and rotate them.
- Modify the softness, colour, opacity, and blur values of areas isolated by geometries.
- Parent multiple shapes to an axis.
- Change the priority order.
- Show or hide geometries in the Player.
- Invert geometries.
- Delete or reset geometries.
- Link geometries using logical operations from the previous secondary layer to the next one.
- Animate and track geometries.

Geometries are useful in many colour grading situations, from selectively colour grading large objects like the sky to small objects like a person's eyes. When you want to colour grade an object that moves through the shot, you can use the tracker to make a geometry follow the moving element. See [Animating the Point Tracker](#) (page 506).

You can work with tangents and vertices to modify, scale, and rotate a geometry around its axis. You can also use the axis of the geometry to move it around the image. You can add and delete axes, and use one axis to move multiple geometries.

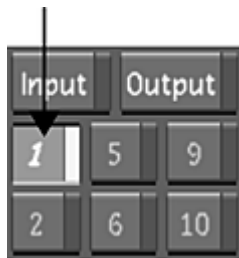
NOTE Field-based projects viewed on the data monitor will demonstrate a half-pixel downshift. Geometries added to the image will also display this downshift.

Accessing the Geometry Controls

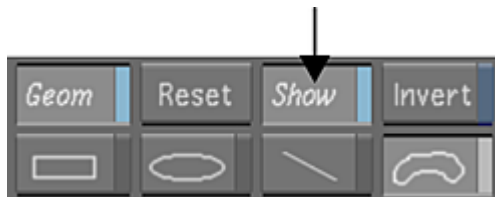
To draw geometries, you work with the Secondaries menu.

To access the Geometry controls:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.

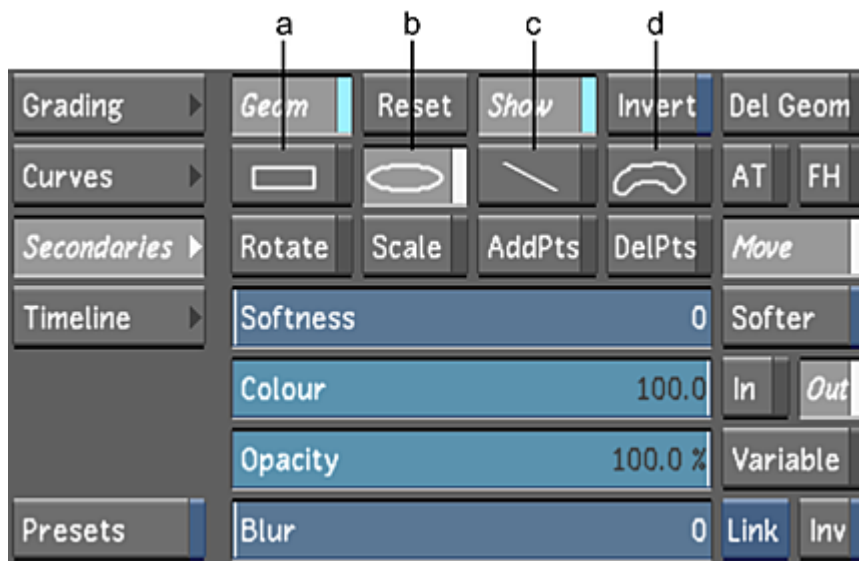


- 2 Enable Show.



If a geometry exists, it is displayed in the Player.

- 3 Enable a geometry.



(a) Rectangle geometry (b) Circle geometry (c) Split screen geometry (d) Free-form (bezier) geometry

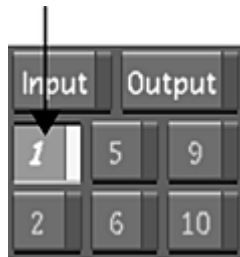
NOTE The Keyer picker is automatically deactivated when a geometry is being created.

Drawing Basic Geometries

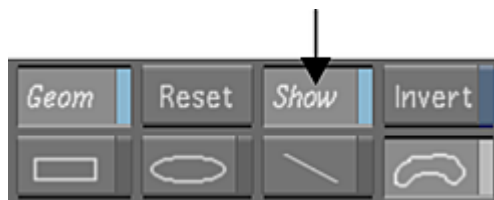
drawing:basic geometriesgeometries:drawing basicFor each secondary, you can draw multiple rectangles or circles to isolate parts of the shot or image for secondary colour grading. Basic geometries can also be converted into free-form (Bezier) shapes.

To draw a rectangle or a circle:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.

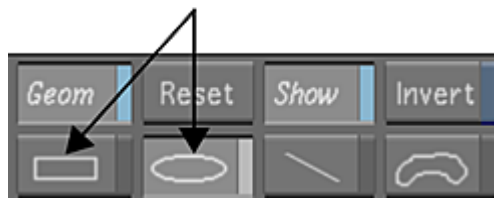


- 2 Enable Show.



If a geometry exists, it is displayed in the Player.

- 3 Enable either the rectangle or the circle shape.



- 4 Draw the shape on the image. In the Player, drag to set the initial dimensions for the geometry. The geometry appears in the Player.

NOTE To add more than one of the same basic shape to a secondary, you must enable the shape each time.

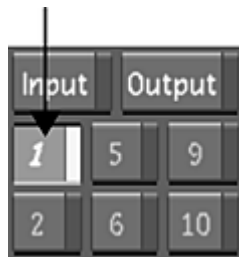
- 5 (Optional) To resize the geometry, drag vertices or a vertex point. To scale it, drag the Z-axis.
- 6 (Optional) To convert a basic shape to a free-form (Bezier) shape, right-click the shape in the Player.

Drawing Free-Form Geometries

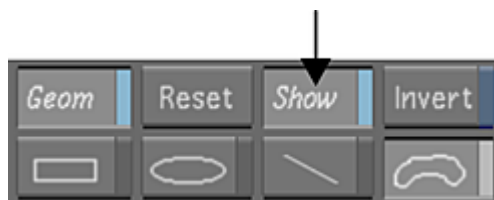
drawing:free-form geometriesgeometries:drawing free-formFor each secondary layer, you can draw multiple free-form (Bezier) geometries to isolate parts of the shot or image for secondary colour grading. When you draw a free-form geometry, you can draw point-to-point using the Free-Form (Bezier) button, use Auto-Tangent mode or Freehand mode, or manually add vertices and tangents.

To manually draw a free-form geometry:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.



- 2 Enable Show.



If a geometry exists, it is displayed in the Player.

- 3 Enable the Free-Form (Bezier) button.



NOTE To add more than one of the same free-form shape to a secondary, you must enable the Free-Form shape button each time.

- 4 Make sure that the FH (freehand) button is disabled.



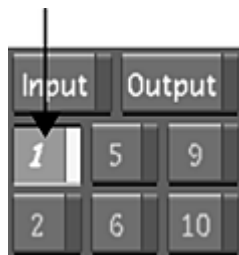
- 5 In the Player, click the image to set the first vertex.
- 6 Click again to add the second vertex.
- 7 To extend the tangents of a vertex and create a smooth curve, drag when you add a vertex.
- 8 Continue adding vertices and create the geometry.
- 9 To close the free-form geometry, click the first vertex.



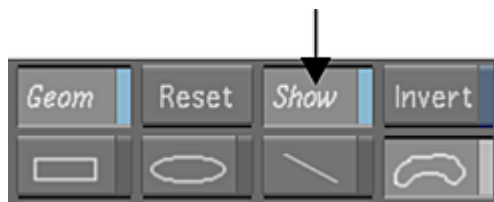
Image courtesy of Hungarian Academy of Film & Theatre, 3rd year

To draw a free-form geometry using AutoTangent mode:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.



- 2 Enable Show.



Any pre-existing geometries will be displayed in the Player.

- 3 Enable the Free-Form (Bezier) button.



NOTE To add more than one of the same free-form shape to a secondary, you must enable the Free-Form shape button each time.

- 4 Enable AT (auto tangent).



- 5 In the Player, click the image to set the first vertex.

- 6 Click again to add the second vertex.

As you move from one vertex to the next, the tangents are automatically interpolated to create a smooth curve between vertices.

- 7 Continue clicking the image to add vertices and create the geometry.

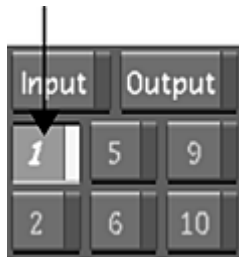
- 8 To close the free-form geometry, click the first vertex.



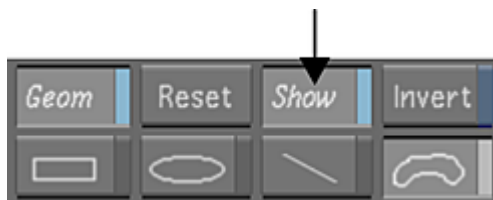
Image courtesy of Hungarian Academy of Film & Theatre, 3rd year

To draw a free-form geometry using Freehand mode:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.



- 2 Enable Show.



Any pre-existing geometries will be displayed in the Player.

- 3 Enable the Free-Form (Bezier) button.



NOTE To add more than one of the same free-form shape to a secondary, you must enable the Free-Form shape button each time.

- 4 Enable FH (freehand).



- 5 In the Player, click and drag on the image to draw the geometry.
The vertices and tangents of the geometry are automatically added as you drag the mouse. The optimal number of vertices is used to create the smoothest curve.
- 6 To close the free-form geometry, release the mouse.

Modifying Geometries

geometries:modifyingOnce you finish drawing a basic or free-form geometry, you can modify its shape, position, and appearance. You can:

- Reposition axes.
- Adjust tangents and vertices.
- Apply transformations.
- Apply constant or variable softness.
- Apply a blur filter.
- Adjust the colour transparency.

TIP To modify the geometry's parameters without the colour correction being visible, right-click the geometry's layer number button. To re-display the colour correction, right-click the button again.

Moving Axes

geometries:moving axesaxes:moving within geometriesAn axis can be moved from its default central position within the geometry. This affects how a geometry will behave when you scale or rotate it.

To move an axis:

- 1 Press **Alt**, right-click the axis, and drag it to another position.

Adjusting Tangents and Vertices

tangents:adjusting to reshape geometriesgeometries:adjusting shapesAdjust the shape of a geometry by manipulating its tangents and vertices. You can:

- Modify the position of vertices and tangents.
- Add and remove vertices and tangents.

- Break tangents.

Moving Vertices and Tangents

In the Player, you can move vertices and tangents to adjust the shape of a geometry.

To move vertices and tangents:

- 1 If you are working with a basic shape, right-click it in the Player to convert it to a free-form geometry.
- 2 In the Secondaries menu, enable Move.



- 3 Do any of the following:
 - To move a vertex, drag it in the Player.
 - To move multiple vertices, drag from anywhere on the screen without vertices. Then draw a selection box around the vertices you want to move and drag them in the Player.

TIP To deselect multiple vertices, click away from the selected ones.

 - To modify the shape or curve of a side, move the adjacent tangents. Drag a tangent handle to change its position.

Adding and Removing Vertices

You can add and remove vertices from a geometry. When you add or remove a vertex, the curve is redrawn according to the change of shape.

To add vertices:

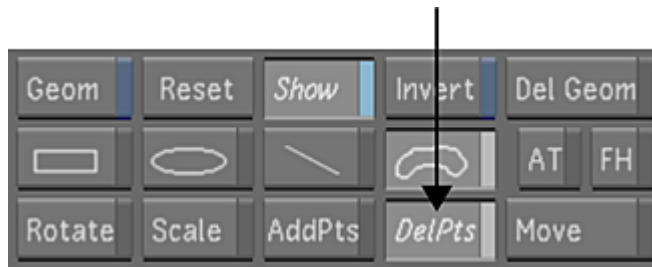
- 1 If you are working with a basic shape, right-click it in the Player to convert it to a free-form geometry.
- 2 In the Secondaries menu, enable Add Pts.



- 3 In the Player, move the mouse over the mask border of the geometry you want to modify. The current position on the geometry is highlighted.
- 4 Click the geometry where you want to add a vertex. The vertex is added to the geometry.

To remove vertices:

- 1 In the Secondaries menu, enable Del Pts.



- 2 In the Player, move the mouse over the mask border of the geometry you want to modify. The current vertex on the geometry is highlighted.
- 3 Click the highlighted vertex. The vertex is deleted from the geometry. The shape of the geometry is adjusted according to the change.

Breaking and Repairing Tangents

You can separate two tangent handles (*break* the tangent) and move them separately. You can also repair broken tangents.

To break and repair tangents:

- 1 To break and move a tangent handle, **Ctrl**-click the tangent handle and drag it.
- 2 To repair a broken tangent handle, **Ctrl**-click it.

Transforming Geometries

scaling; geometries rotating, geometries moving, geometries transforming You can apply transformations to change the position and size of a geometry. You can:

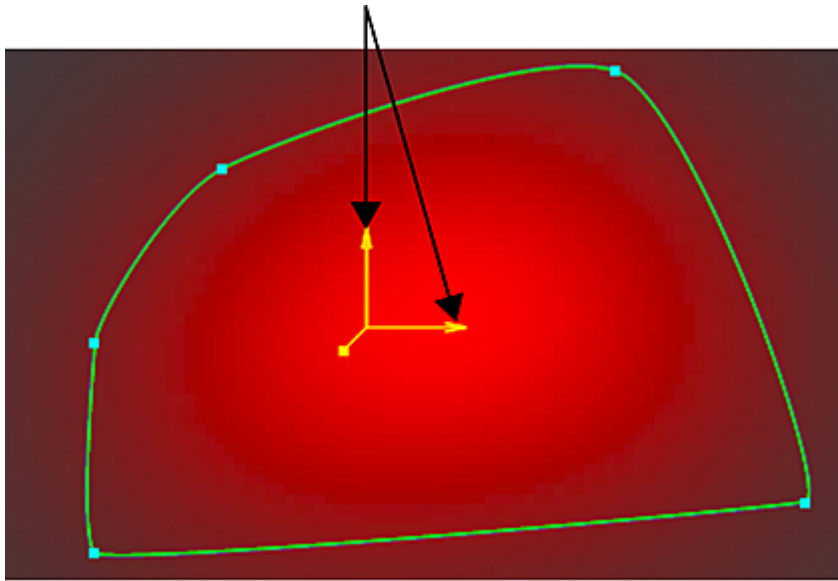
- Move geometries.
- Rotate geometries.
- Scale geometries.

To move a geometry:

- 1 In the Secondaries menu, enable Move.



- 2 In the Player, drag the axis of the geometry you want to move.
- 3 To lock the geometry to the X- or Y-axis when you move it, you can drag from the arrowheads of the X- or Y-axis.



To rotate a geometry:

- 1 Do one of the following:
 - In the Player, right-click the axis and hold down the right mouse button while dragging.
 - In the Secondaries menu, enable Rotate. Then, in the Player, drag the axis of the geometry you want to rotate.



To scale a geometry:

- 1 In the Secondaries menu, enable Scale.



- 2 In the Player, drag along the axis of the geometry in the direction you want to scale.

Drag the:	To scale the geometry:
X-axis	Along the X-axis.

Drag the:	To scale the geometry:
Y-axis	Along the Y-axis.
Global Scale axis	Along the Z-axis.

TIP You can drag the Z-axis to scale a geometry in any transformation mode—in Rotate, Move, or Scale mode.

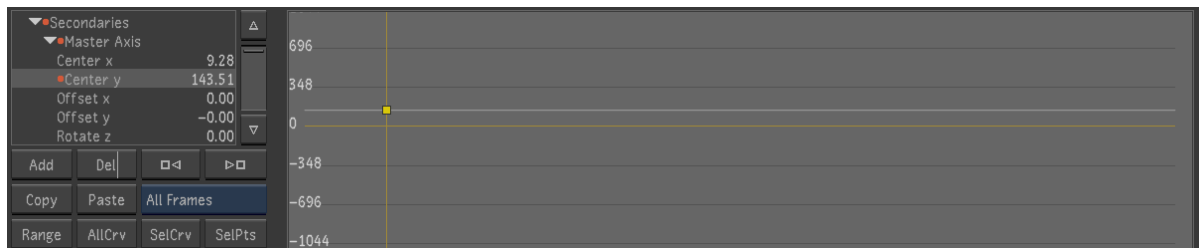
Transforming All Geometries With the Secondaries Master Axis

You can transform all geometries simultaneously in the Animation Editor, using the Master Axis. The Master axis affects all geometries on all secondaries for the current shot. You can:

- Move all geometries.
- Rotate all geometries.
- Scale all geometries.

To use the Master Axis:

- 1 Access the Animation menu.
- 2 Expand the Secondaries folder.
The first entry in the Secondaries folder is the Master Axis.
- 3 Expand the Master Axis folder.
- 4 Select the parameter you want to modify.
- 5 Add a keyframe at the desired frame, by clicking Add.
- 6 Select the keyframe and set the its value in the Curve Editor.



Applying Softness to Geometries

softness:applying to geometriesgeometries:softening edgesYou can increase and decrease the softness range to soften the edges of geometries. You can set the softness of the mask edge using:

- Constant softness.
- Variable softness to vary the softness range for different parts of the mask.

Applying Constant Softness

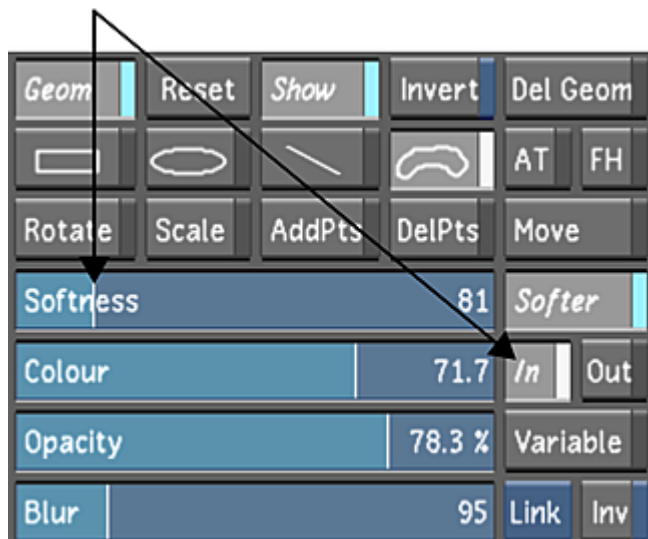
You can apply a constant range of softness to the edge of a geometry on a secondary. You can apply constant softness to the inside or outside of the mask border. You do not need to convert a basic shape to a free-form geometry in order to apply constant softness.

To soften the edges of the geometry:

- 1 Do one of the following:
 - In the Player, select a geometry.
 - From the Axes list, select a geometry or its axis.



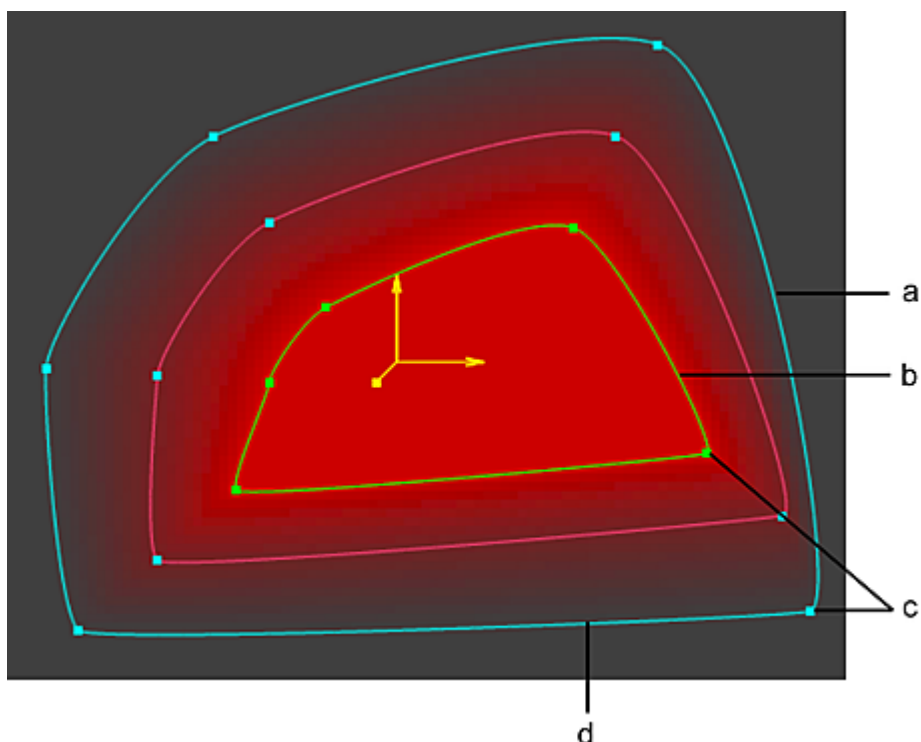
- 2 In the Secondaries menu, do one of the following:
 - To apply softness to the inside of the mask border, enable In, and then drag the Softness slider. Drag right to increase softness. Drag left to decrease softness.
 - To apply softness to the outside of the mask border, enable Out, and then drag the Softness slider. Drag right to increase softness. Drag left to decrease softness.



The softness level set by the Softness slider is applied to the geometry.

Applying Variable Softness

You can apply variable softness to the edges of one or more geometries to customize the softness at different parts of the mask. Variable softness has two softness borders, one inside and one outside the mask border. It also includes inner and outer softness vertices for each regular mask vertex.



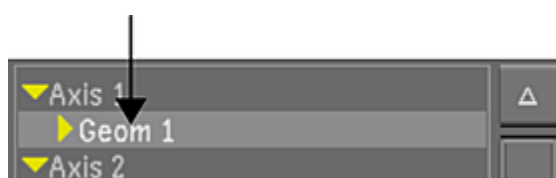
(a) Outer softness border (b) Inner softness border (c) Softness vertices (d) Mask border

You can customize the softness at different parts of the mask by adjusting the distance of each softness vertex from the mask border—you set a softness value based on each vertex in the shape.

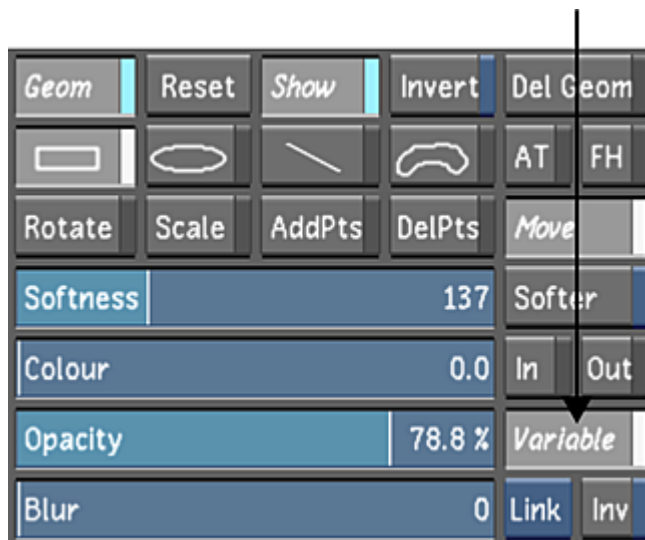
Variable softness can only be applied to free-hand geometries, or to basic geometries that have been converted to a free-form geometry.

To apply variable softness to the edges of the geometry:

- 1 Do one of the following:
 - In the Player, select a geometry.
 - From the Axes list, select a geometry or its axis.

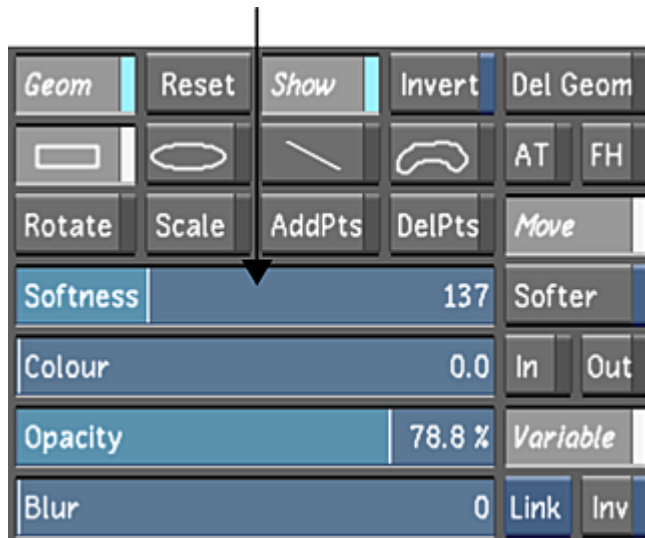


- 2 In the Secondaries menu, enable Variable.



Softness is applied inside and outside the mask border.

- 3 Drag the Softness slider. Drag right to increase softness. Drag left to decrease softness.



The softness level set by the Softness slider is applied to the geometry.

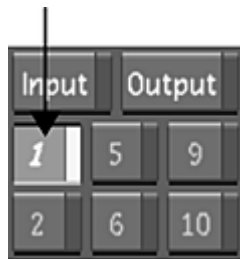
- 4 Drag the vertices and tangents to adjust the shape and vary the softness at the edges of the geometry. See [Adjusting Tangents and Vertices](#) (page 458).

Blurring Geometries

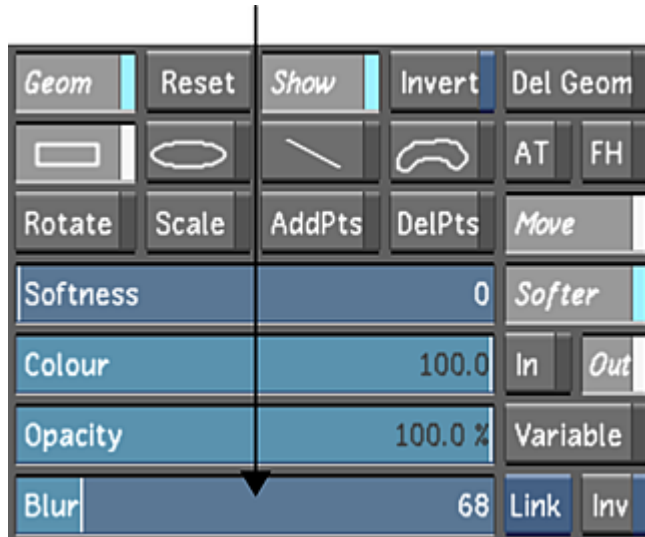
blurring:geometriesgeometries:blurringYou can apply a Gaussian blur to soften all geometries on the current secondary layer.

To apply a Gaussian blur:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.



- 2 Drag the Blur slider. Drag right to increase the blur. Drag left to decrease the blur.



Setting the Colour and Opacity of Geometries

colours:adjusting for geometriesopacity, adjusting for geometriesgeometries:setting colour and opacityYou can adjust the colour and opacity of a geometry to affect the output image.

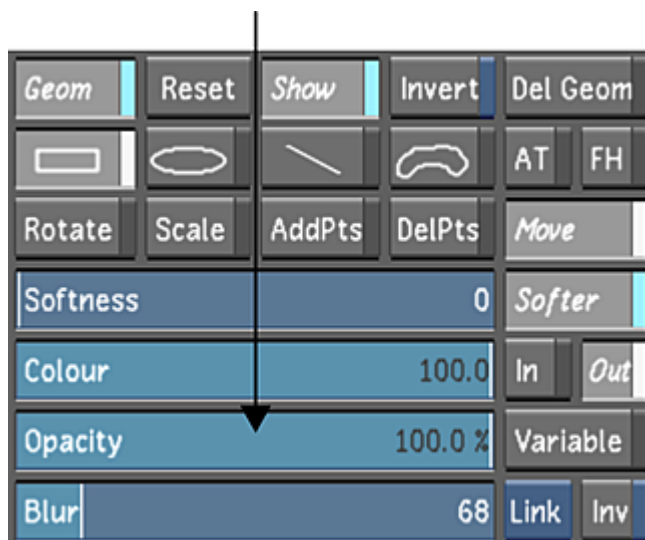
If you are applying only one geometry or several non-overlapping geometries to a secondary, modify either the colour or opacity to adjust the matte—in this case, colour and opacity will have the same effect on the image. If you are applying several overlapping geometries to a secondary, modify both colour and opacity to adjust the matte—colour will set the intensity of the colour of the geometry, whereas opacity will set the transparency, creating a blend between the overlapping geometries.

To set the colour and opacity of a geometry:

- 1 Do one of the following:
 - In the Player, select a geometry.
 - From the Axis list, select a geometry or its axis.



- 2 In the Secondaries menu, drag the Opacity slider to adjust the transparency of the mask.



The Opacity slider defines the blend between overlapping geometries. A value of 50% is a 50/50 blend. A value of 100% shows the exact colour of the geometry. A value of 0% shows what is behind the selected geometry.

- 3 To set the intensity of the colour of the geometry, drag the Colour slider to set a colour value between 0% and 100%. A value of 50% means the area is 50% grey.

Adjusting the Colour and Opacity of a Matte Overlay

matte overlay:adjusting colourmatte overlay:adjusting opacityYou can change the way a matte is displayed to help you easily view the isolated colour. The colour and opacity of the unselected region in a matte can be easily modified by adjusting the Matte Overlay parameters.

To adjust the colour and opacity of a matte overlay:

NOTE This procedure will not affect the output image.

- 1 Select and then right-click a secondary on which a matte is present.
- 2 Depending on your user settings, press F11 once or twice to enable the Matte view. See [Display & Interface Settings](#) (page 85).
- 3 In the Setup menu, select Interface to display the Matte Overlay panel.

NOTE The default values are displayed.



- 4 Drag the Opacity slider as well as the R, G, and B sliders to adjust the opacity and colour of the unselected region. See [Matte Overlay Settings](#) (page 119).



Secondary view (default)



Secondary view (adjusted)

TIP Click Reset twice if you wish to reset the sliders to their default values.

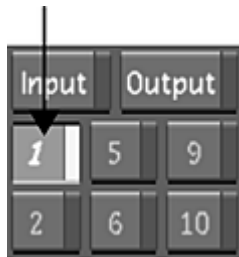
Adding a Split Screen

The split screen feature lets you divide the screen in two in order to apply separate colour gradings to each half of the image.

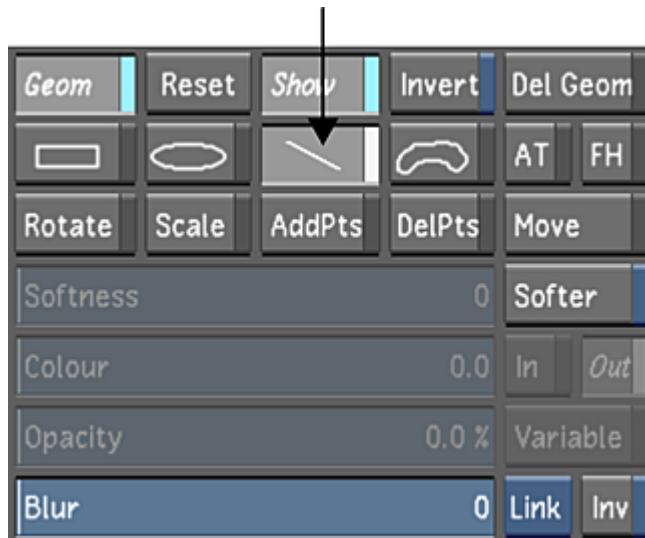
Split screens can be moved and rotated.

To add a split screen:

- 1 In the Secondaries menu, right-click a secondary layer button to activate it.



- 2 Enable the Split Screen button.



- 3 In the Player, click where you would like the split screen applied.
The split screen is applied horizontally in the spot where you clicked. You can now colour grade this part of the image.

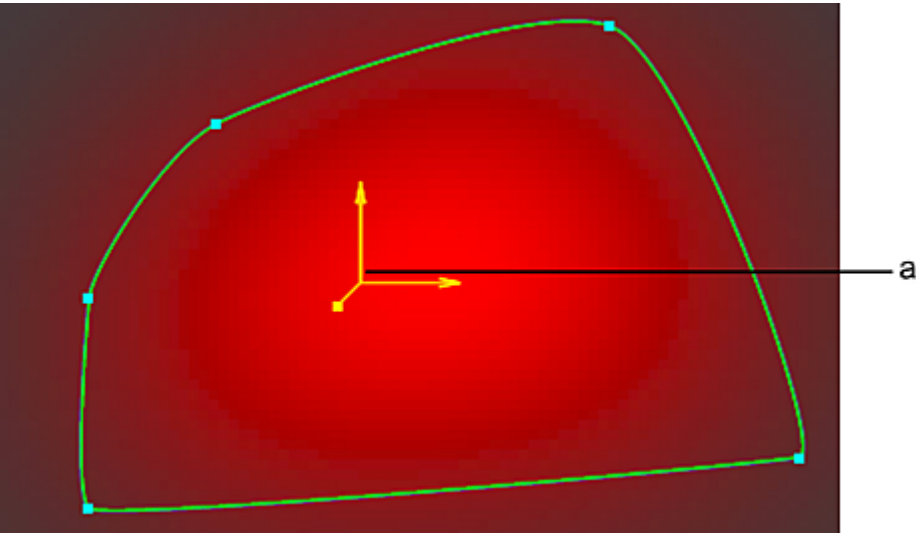


Image courtesy of Technicolor (formerly Toybox)

- 4 To grade the other half of the split screen, enable Outside (see [Colour Grading Inside and Outside Secondaries](#) (page 450)).
- 5 To move the split screen up or down, click and drag the split screen's axis.
- 6 To rotate the split screen, do one of the following:
 - Enable Rotate and then drag the axis.
 - Right-click the axis and drag.

Adding and Deleting Axes

geometries:adding and deleting axesaxes:adding and deleting from geometriesBy default, every geometry you draw has an axis. Each geometry and its axis are displayed in the Player.



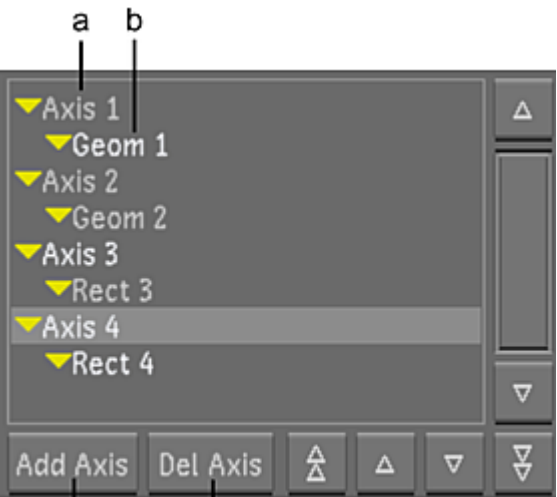
(a) Geometry axis

You use the Axes list to add and delete axes, as well as parent multiple axes to a master axis. You use the schematic view to create parent/child connections among shapes and axes.

A parent axis allows you to move, scale, rotate, and track multiple geometries.

The Axes List

geometries:deleting an axisgeometries:creating a parent axesaxes list:deleting an axesaxes list:creating a parent axesaxes list:view of geometries and their axesThe Axes list appears in almost all Lustre menus and provides a list view of geometries and their axes.



(a) Axis (b) Geometry (c) Add Axis button (d) Del Axis button

When you select the axis or the geometry in the Axes list, it is also selected in the Player. The inverse is also true.

To create a parent axis:

- 1 In the Axes list, select the axis you want to parent. To select multiple axes, **Shift**-click each axis.
- 2 Click Add Axis.

The axes you selected are now parented to a new master axis.

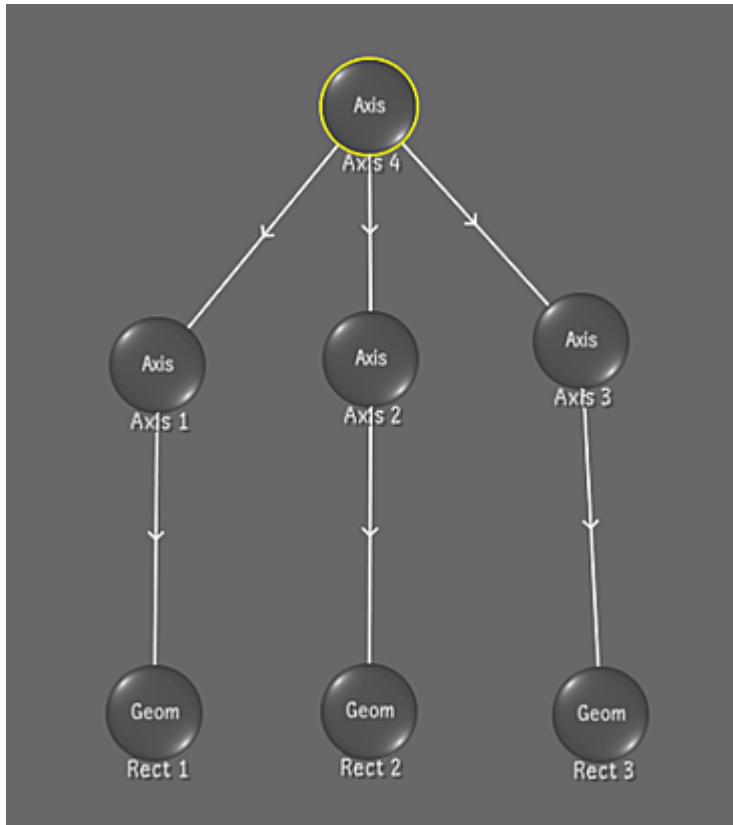
To delete an axis:

- 1 In the Axes list, select the axes you want to delete. To select multiple axes, **Shift**-click each axis.
- 2 Click Del. Axis.

The axis is deleted from the Player and the Axes list.

Schematic View

axes:viewing in schematic viewschematic view, toggling toAs an alternative to using the Axes list to view the axis hierarchy and create parent axes, you can use the schematic.



The schematic appears in the Player and allows you to parent shapes and axes in any combination you like. For example, a shape could parent an axis, or vice versa.

Creating a master axis and using it to parent multiple axes simultaneously is performed the same way as when using the Axes list. However, in the schematic, you can also make connections one at a time.

NOTE Axes cannot be deleted in the schematic.

To create parent/child connections using the schematic:

- 1 Press the tilde key (~) to switch to a schematic view of the axis hierarchy.

NOTE To pan within the schematic, hold down the middle mouse button and drag.

- 2 To connect one item to another, click just inside the border of the parent object and drag to the intended child object. The connection is represented by a white line (yellow when selected), with the hierarchy indicated by an arrow that points away from the parent object and towards the child.

NOTE To move an item, click in its centre and drag. To break a link, drag a red line across the connection line.

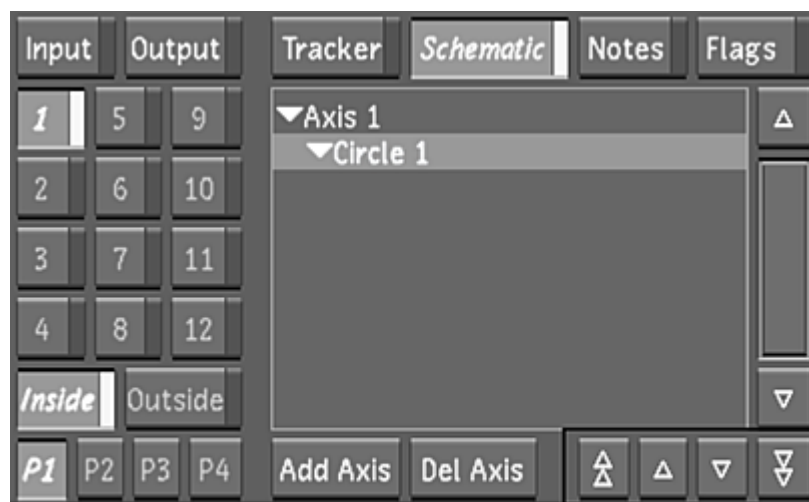
- 3 Switch back to default view by pressing ~ again.
The changed hierarchy is displayed in the schematic.

Changing the Priority Order of Geometries

secondary colour grading:changing layer ordergeometries:changing priority orderWhen you create several free-form geometries on a secondary layer, you can change the order in which they are drawn, or layered in the scene. This affects the resulting image because a geometry with a higher priority has precedence over one with a lower priority. You can use the priority order to create complex colour effects involving multiple geometries.

To set the priority of a mask:

- 1 Select the geometry.
- 2 Enable Schematic to display the priority order buttons.



(a) Priority order buttons

3 Do any of the following.

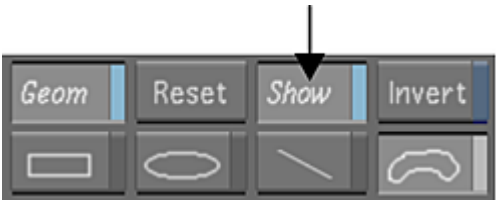
Click:	To move the geometry:
	To the top layer.
	To the bottom layer.
	Down one layer.
	Up one layer.

Showing and Hiding Geometries

secondary colour grading:showing and hiding geometriesgeometries:showing and hidingYou can show or hide geometries after you create them. Geometries that are hidden do not appear in the Player, but are applied to the secondary—depending on which logical operation you use.

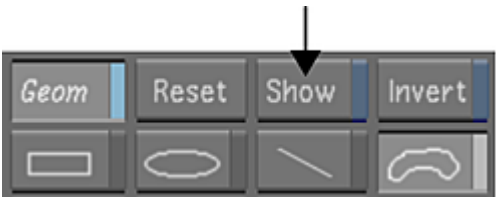
To show a geometry:

- 1 In the Secondaries menu, enable Show.



To hide a geometry:

- 1 Disable Show.

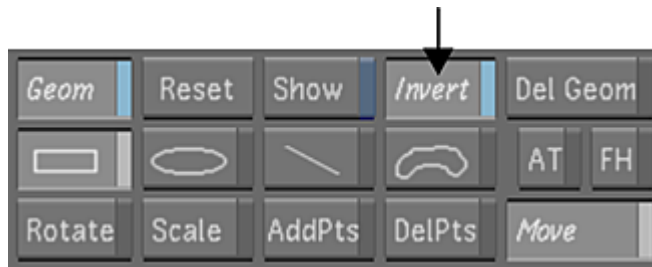


Inverting Geometries

inverting:geometriesgeometries:invertingYou can invert geometries on the current secondary layer.

To invert geometries:

- 1 In the Secondaries menu, enable Invert.



Deleting Geometries and Resetting Secondaries

resetting:secondariesdeleting:geometriessecondary colour grading:resettinggeometries:deletingDelete geometries one at a time from a secondary, or reset the secondary to delete all geometries simultaneously.

To delete a geometry:

- 1 In the Secondaries menu, enable Del Geom.



- 2 In the Player, select the geometry.
The selected geometry is deleted.
- 3 Select the geometry's axis.
The selected axis is deleted. Once both the axis and geometry have been deleted, the secondary colour grade is applied to the entire image.

NOTE You can also delete geometries and their axes from the Axes list. To delete a geometry or axis, select it in the Axis list (or *Shift*-click to select several), and then click Del. Axis.

To reset a secondary:

- 1 In the Secondaries menu, enable a Secondary button.
- 2 Do one of the following:
 - To clear all geometries from the layer and apply the secondary colour grade to the entire image, click the Reset button in the Secondaries menu and then click again to confirm.



- To clear all geometries from the layer without applying the secondary colour grade to the entire image, click the Reset button in the main menu.



Linking Geometries across Secondary Layers

linking, geometries across layersgeometries:linking across secondariesYou can link geometries from the previous secondary layer to the current secondary layer by selecting an option from the Link option box, located in the Secondaries menu. Use the Link option box when you have already applied a key, a geometry, or both to the current secondary layer.

NOTE You can use the Link option box without applying any key or geometry to the current secondary layer.

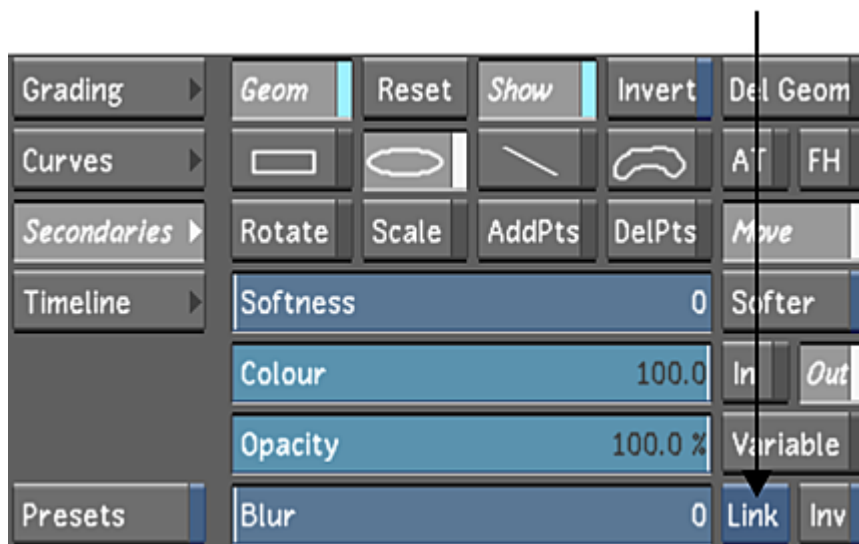
When you use the Link option box, a logical operation is applied to determine how the geometries from the previous layer are combined with the key and geometries on the current secondary layer, and what areas of the image are colour graded. Depending on what you want to accomplish with the secondary, you can use a logical operation to add or exclude the inside of the geometries from the previous layer to the key and geometries on the current secondary layer, or intersect the geometries with the current secondary layer. You can also invert the geometries from the previous layer using the Invert button.

To combine geometries from the previous secondary layer with the current secondary layer:

- 1 Make sure you have multiple secondary layers containing keys and geometries, and then in the Secondaries menu, enable the secondary you want to work on.

NOTE The previous secondary layer must have some sort of mask applied—it can be a key, a geometry, or both.

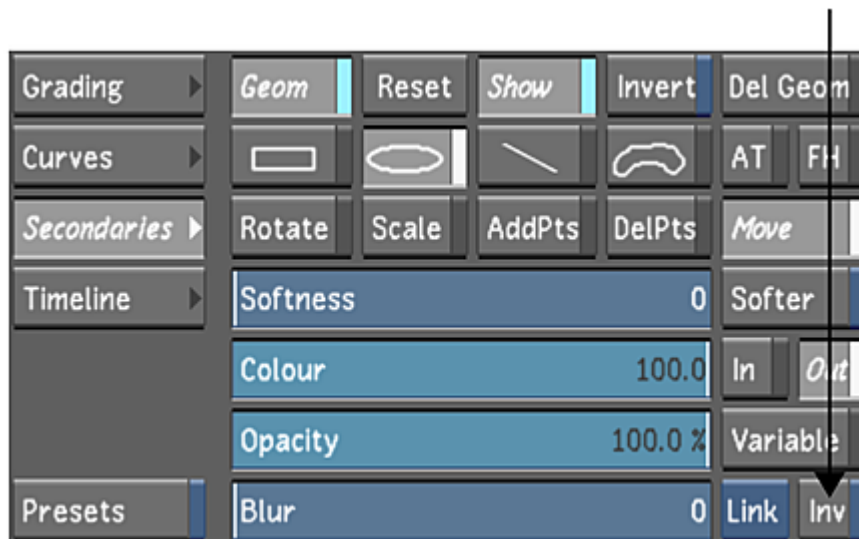
- 2 Select a logical operation from the Link option box. The logical operation you select determines what is colour graded by the current secondary.



Select:	To:
	Add the current secondary to the previous one.
	Subtract the current secondary from the previous one.
	Intersect the current secondary with the previous one.

NOTE If you do not want to apply a logical operation, select the Link option.

- 3 To invert the previous selection, enable Inv.



When you invert geometries from the previous secondary layer, the logical operation you choose will combine the invert of the geometries from the previous secondary layer with the current one.

Creating a Secondary by Keying a Range of Colours

colour grading:keying ranges of colours to create secondariessecondary colour grading:keying ranges of colourskeys:creating to isolate ranges of coloursYou can create secondaries by defining transparent regions in a shot, based on a specific range of colour. This process is known as *keying*.

When you extract a key to isolate a colour, you can view it in the Player. Keys are based on the chrominance and luminance of a selected colour from the original image. Once you have selected a colour, you then set the tolerance and softness ranges by sampling the original image. Tolerance defines how similar luminance and chrominance values will be keyed (made transparent) in the secondary. A higher tolerance setting extracts a broader range of luminance and chrominance values, while a lower setting extracts a narrower range, leaving the rest of the image untouched. Softness defines how similar luminance and chrominance values are softened (made partially transparent) for the secondary. A higher softness setting extracts a broader range of luminance and chrominance values, while a lower setting extracts a narrower range, leaving the rest of the image untouched. You can soften the edge of a key to blend the secondary colour grading with the rest of the image.

Keys are, by default, based on original scans, bypassing any input primary colour grading. This allows you to modify an image upstream of any secondary without changing the key. For example, after you key a secondary, you can safely perform a hue shift from the Curves menu. The key, based on the original image colour, is unaffected. To base a key on colour corrected sources, enable the Src: Prim (Source Primary) button.

For extracting keys to isolate colours, Lustre provides two keyers that work independently of one another:

- The Hue, Luminance, and Saturation (HLS) Keyer, which is used to extract a key based on the softness and tolerance of the hue, luminance, and saturation channels of the source image. See [Using the Hue, Luminance, and Saturation \(HLS\) Keyer to Extract a Key](#) (page 477).
- The Diamond Keyer, which is used to extract a key based on the chrominance range and luminance levels of the source image. See [Using the Diamond Keyer to Extract a Key](#) (page 485).

Using the Hue, Luminance, and Saturation (HLS) Keyer to Extract a Key

channels:selecting for a keykeys:selecting channelskeyer: HLS Keyer usingHLS Keyer:usingHLS Keyer:selecting channels for keysWith the HLS Keyer, you can extract a key based on hue, luminance, and saturation channels. You can use one or more of these channels to create a key.

You can also use previously saved keyer presets. See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

Once you have extracted a key, you can modify a key by adjusting the Master Tolerance and Master Softness sliders or by using the Add/Remove Softness and Tolerance buttons. You can further modify a key using the Cleanup, Shrink, and Blur parameters.

Before extracting a key, you can modify the source image by using the Input Transform Log to Lin and Soften options. See [Tools Settings](#) (page 93).

NOTE To disable the HLS Keyer at any time, right-click on the Keyer option box.

Use the following workflow to extract a key for colour isolation.

Step:	Refer to:
1. Determine which channels you want to use in a key.	See Setting Keying Parameters in the HLS Keyer (page 478).

Step:	Refer to:
2. Select the colour that you want to key.	See Sampling a Colour in the HLS Keyer (page 479).
3. View your secondary to determine the range of colour you have keyed.	See Viewing Secondaries in the HLS Keyer (page 481).
4. Set the tolerance to widen or narrow the range of luminance and chrominance values to extract in a key.	See Setting the Tolerance Range in the HLS Keyer (page 482).
5. Set the softness to widen or narrow the range of luminance and chrominance values to extract at the edge of a key.	See Setting the Softness Range in the HLS Keyer (page 484).
6. Blend the light and dark edges of a key by shrinking, eroding, or blurring the edges of a key.	See Modifying the Edges of the Key (page 495).
7. Clean up a key for colour grading.	See Removing Stray Pixels from a Key (page 496).
8. Increase or decrease the softness of pixels that are in the tolerance range.	See Sharpening a Key Source Image (page 497).

The following procedures are not essential for extracting a key. You can perform these procedures at any time after extracting a key.

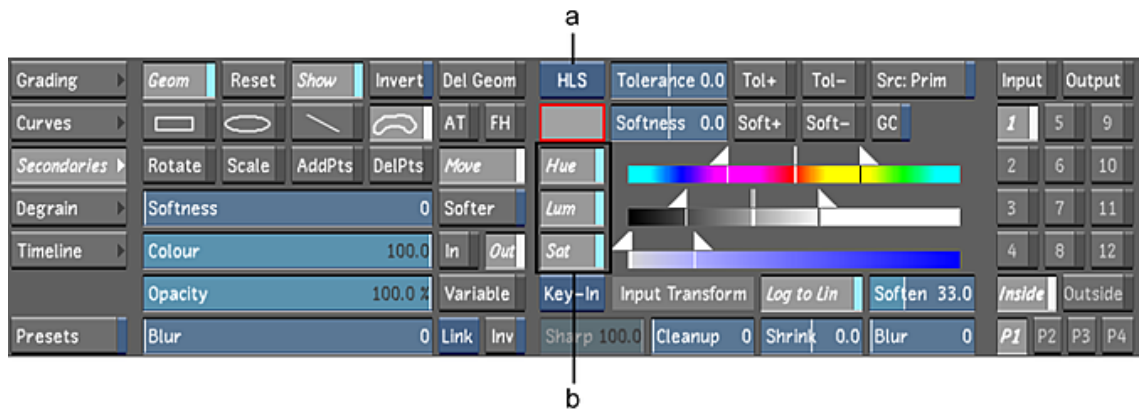
Step:	Refer to:
1. Remove colours that you do not want to include in a key.	See Inverting Keys (page 497).
2. Exclude a key that you do not want to appear in a secondary.	See Excluding Keys from Secondaries (page 498).

Setting Keying Parameters in the HLS Keyer

You need to determine which channels (hue, luminance, and saturation) you will use to extract your key.

To set keying parameters:

- 1 In the Colour menu, click Secondaries.
The Secondaries menu appears.
- 2 Click the Keyer option box to toggle to the HLS Keyer.
The HLS Keyer appears in the Secondaries menu.



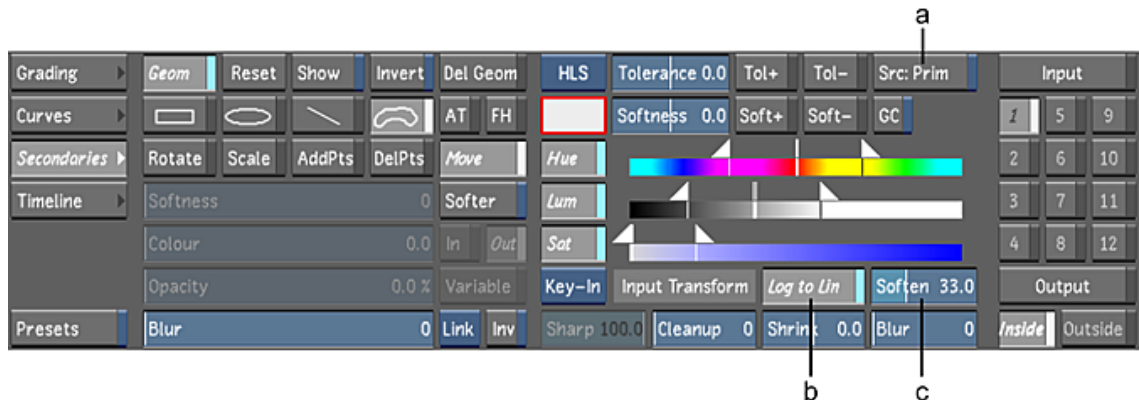
(a) Keyer option box (b) Hue, luminance, and saturation buttons

- 3 To select the basis of a key, enable one, two, or all three of the channels. Channel selection depends on what you want to base your key on: chrominance, luminance, or a combination of both.
 - To extract a key based on the hue of the selected colour range, enable Hue. To exclude hue from a key, disable Hue.
 - To extract a key based on the luminance of the selected colour range, enable Lum. To exclude luminance from a key, disable Lum.
 - To extract a key based on the saturation of the selected colour range, enable Sat. To exclude saturation from a key, disable Sat.

NOTE Chrominance is comprised of both the Hue and Saturation channels.

- 4 Enable the Source Primary button to use primary grading results as the input to the keyer.

NOTE When Src: Prim is disabled, the raw scan is used as the input to the keyer, effectively bypassing any input LUTs and primary grading that has been applied to your shot.



(a) Source Primary button (b) Log to Lin button (c) Soften slider

- 5 Enable the Log to Lin button. See [Tools Settings](#) (page 93).
- 6 Adjust the Soften slider. See [Tools Settings](#) (page 93).

Sampling a Colour in the HLS Keyer

HLS Keyer:colour samplingcolour sampling:HLS KeyerThe typical way to extract a key is to sample a pixel or an average colour in the image using the colour picker. You can also use predefined colour grading

parameters, called presets, by right-clicking the Hue, Luminance, or Saturation button. See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

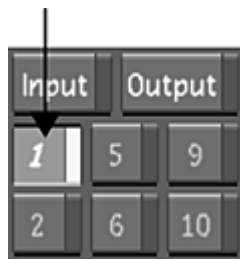
To sample a colour:

- 1 Set the view mode to Output. You can click the O button.

NOTE Pressing **F12** to set the view mode to Output only works from Matte view.

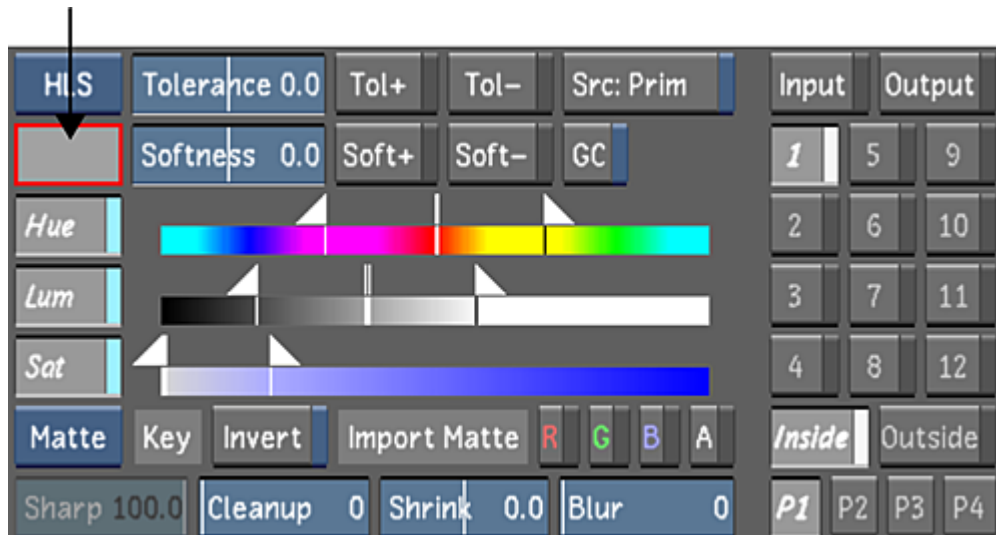


- 2 In the Secondary layers panel, activate a secondary layer.

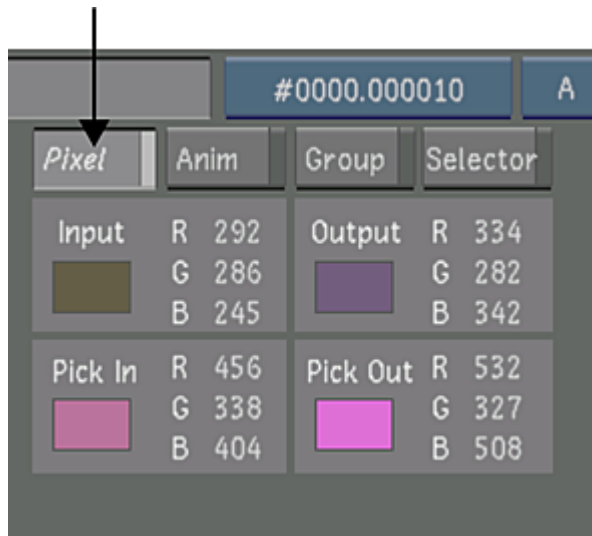


NOTE If you do not activate the secondary layer, the colour pot will not be updated with your colour sample.

- 3 Right-click the Keyer option box to enable the HLS Keyer.
The letters in the Keyer option box turn bright white indicating that the HLS Keyer is enabled.
- 4 Click the colour pot.
The HLS Keyer is enabled and the colour pot is outlined in red, indicating that it is in use.

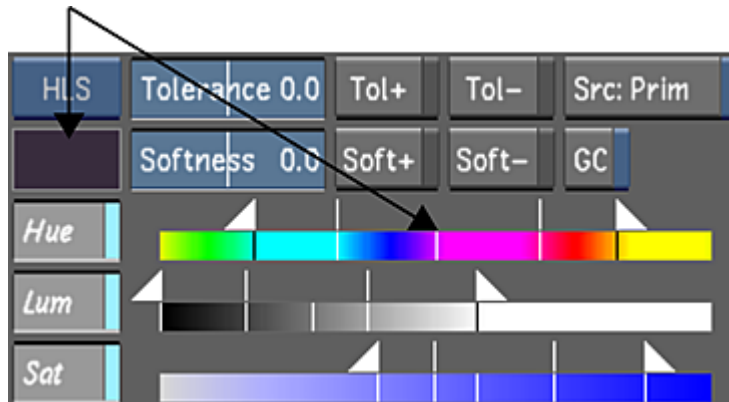


- 5 Click Pixel to enable the Pixel Analyser.



- 6 Set the Log to Lin parameter. See [Tools Settings](#) (page 93).
- 7 Adjust the Soften slider. See [Tools Settings](#) (page 93).
- 8 Sample the image:
 - To sample a single pixel, click and drag in the image until you locate the pixel you want to sample. As you drag, the colour of the current pixel appears in the Pixel Analyser. When you locate the pixel you want to sample, release the mouse.
 - To sample an average taken from a range of colours in the image, **Alt**-drag the image in the Player.

The cursor changes to a colour picker when you move it over the image in the Player. When you release the mouse, the centre tolerance and the initial softness and tolerance ranges are set for the channels that are enabled. The colour pot displays the sampled colour.



- 9 Click the colour pot again to finish defining the colour.

Viewing Secondaries in the HLS Keyer

keys:viewing resultssecondary colour grading:viewing key resultsHLS Keyer:viewing secondariesDiamond Keyer:viewing secondariesOnce you have sampled a colour for a key, you can view the resulting secondary in the Player. You can view a key in Secondary view or Matte view by toggling the **F11** key. Secondary view displays the keyed out colour as is; unsampled colours are overlayed with a uniform colour by default. Matte view displays the alpha channel, a black and white template indicating which parts of the image are transparent (black), and which are opaque and selected (white).

To view a secondary:

- 1 Select the secondary you want to view.
- 2 Display the image in Secondary view by pressing F11.

In Secondary view, the colour that is keyed out in the current secondary is unchanged; unsampled colours are overlayed with a uniform colour by default. See [Matte Overlay Settings](#) (page 119).



- 3 Press F11 to display Matte view. See [Display & Interface Settings](#) (page 85).

In Matte view, the white parts of the matte represent the selected colours which can be colour graded. The black parts represent the unselected colours in the secondary. Greys indicate the zone of softness.

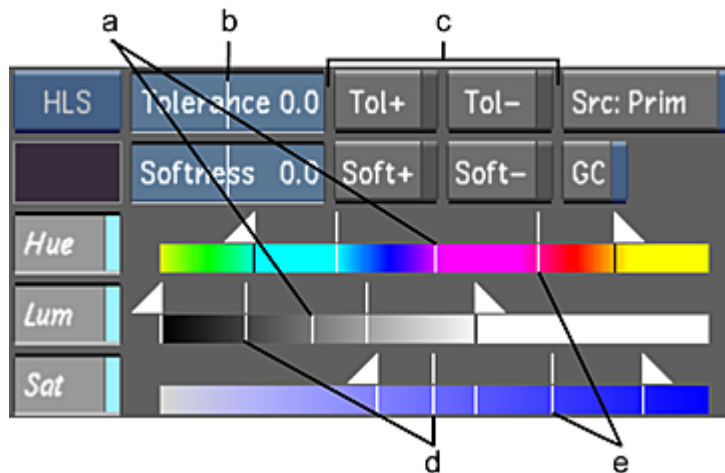


Setting the Tolerance Range in the HLS Keyer

tolerance:setting range for keys, HLS Keyerkeys:setting tolerance range, HLS KeyerHLS Keyer:setting softness rangeYou can set the tolerance range of colours to be fully keyed (transparent) and to remove unwanted greys from a key. The maximum and minimum tolerance values define the range of colours included in the secondary. The closer a pixel matches the key colour, the greater its transparency. Conversely, the less a pixel matches the key colour, the greater its opacity.

To set the tolerance, you can use the colour picker, the Master Tolerance slider, or the Tolerance Range indicators. With the colour picker and the Master Tolerance slider, you set the tolerance range for hue,

luminance, and saturation together. With the Tolerance Range indicators, you set the tolerance range for hue, luminance, and saturation individually.



(a) Centre Tolerance indicators **(b)** Master Tolerance slider **(c)** Add Tolerance/Remove Tolerance buttons **(d)** Minimum Tolerance Range indicators **(e)** Maximum Tolerance Range indicators

To set the tolerance range using the colour picker:

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 In the Secondaries menu, enable the Add Tolerance or Remove Tolerance button beside the Master Tolerance slider to increase or decrease tolerance.
- 3 Click and drag in the image to include it in the tolerance range. Alt-drag in the image to select a larger area.

The tolerance is modified.

To set the tolerance range using the Master Tolerance slider:

NOTE The Master Tolerance slider controls the position of all of the sliders in all of the channels (even when they are not enabled).

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 Set the tolerance range:
 - To increase tolerance, drag the Master Tolerance slider to the right.
 - To decrease tolerance, drag the Master Tolerance slider to the left.

When you release the slider, the tolerance is modified and the slider returns to its original position.

To set the tolerance range for the hue, luminance, or saturation channel:

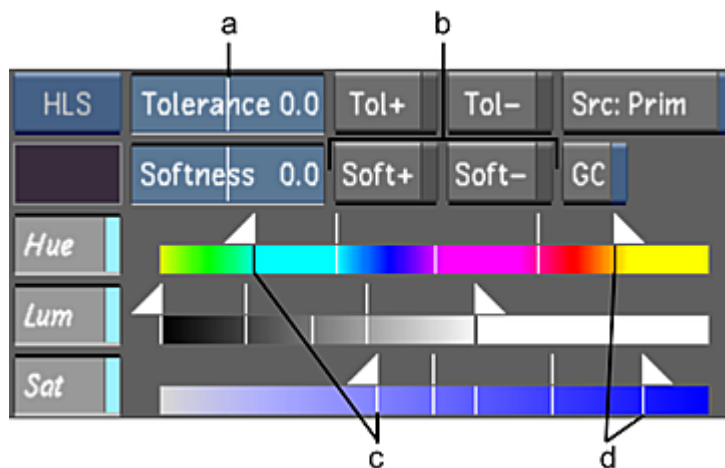
- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 For the hue, luminance, or saturation channel, set the centre tolerance value using the Centre Tolerance indicator. The Centre Tolerance indicator acts as a reference point for the tolerance range. Make sure to place your cursor directly over the indicator and then drag it to the left or right.
When you move the Centre Tolerance indicator, the other indicators move as well—the softness and tolerance ranges are shifted.
- 3 For the hue, luminance, or saturation channel, set the minimum value for the tolerance range using the Minimum Tolerance Range indicator. Drag the indicator to the left to increase tolerance. Drag the indicator to the right to decrease tolerance.

- 4 For the hue, luminance, or saturation channel, set the maximum value for the tolerance range using the Maximum Tolerance Range indicator. Drag the indicator to the left to decrease tolerance. Drag the indicator to the right to increase tolerance.

Setting the Softness Range in the HLS Keyer

softness:setting range for keys, HLS Keyerkeys:setting softness range, HLS KeyerHLS Keyer:setting softness rangeOnce you have set the tolerance range, you can then set the softness range. Softness sets the range of colours to make semi-transparent and can create a softer key. Use softness to create a more natural and softer look when applying secondary colour correction.

To set the softness of a key, you can use the colour picker, the Master Softness slider, or the Softness Range indicators. With the colour picker and the Master Softness slider, you set the softness range for hue, luminance, and saturation together. With the Softness Range indicators, you set the softness range for hue, luminance, and saturation individually.



(a) Master Softness slider (b) Add Softness/Remove Softness buttons (c) Minimum Softness Range indicators (d) Maximum Softness Range indicators

To set the softness range using the colour picker:

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view. In Matte view, you can see the modifications you make to the softness. You can toggle between Matte view and Secondary view while you fine-tune a key.
- 2 In the Secondaries menu, enable the Add Softness or Remove Softness button to increase or decrease the softness.
- 3 Click and drag an area of the image. Alt-drag in the image to select a larger area. The softness is modified.

To set the softness range using the Master Softness slider:

NOTE The Master Softness slider controls the position of all of the sliders in all of the channels (even when they are not enabled).

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view. In Matte view, you can see the modifications you make to the softness. You can toggle between Matte view and Secondary view while you fine-tune a key.
- 2 Set the softness range:
 - To increase softness, drag the Master Softness slider to the right.

- To decrease softness, drag the Master Softness slider to the left.

When you release the slider, the softness is modified and the slider returns to its original position.

To set the softness range for the hue, luminance, or saturation channel:

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
In Matte view, you can see the modifications you make to the softness. You can toggle between Matte view and Secondary view while you fine-tune a key.
- 2 For the hue, luminance, or saturation channel, set the minimum value for the softness range using the Minimum Softness Range indicator. This controls the minimum softness of edges between the image and the key colour. Drag the indicator to the left to increase the softness range. Drag the indicator to the right to decrease the softness range.
- 3 For the hue, luminance, or saturation channel, set the maximum value for the softness range using the Maximum Softness Range indicator. This controls the maximum softness of edges between the image and the key colour. Drag the indicator to the left to decrease the softness range. Drag the indicator to the right to increase the softness range.

Using the Diamond Keyer to Extract a Key

keyer: Diamond Keyer usingThe Diamond Keyer provides comprehensive controls to set the key colour, as well as the chrominance range and luminance levels for softness and tolerance on the hue cube. You can set these by using sliders and numeric fields, or by sampling colours in the image.

With the Diamond Keyer, you can extract a key based on a preset red, green, blue, cyan, magenta, or yellow colour, or on a sampled colour. You can also use previously-saved keyer presets. See [Saving and Loading Presets Using the Presets Lists](#) (page 407). By manipulating the chrominance Softness and Tolerance Diamonds, which define the boundaries of the chrominance range for softness and tolerance on the hue cube, you can quickly and easily isolate the colour for which you want to extract a key.

You can modify a key by adjusting the luminance levels using the Luminance gradient controls and by adjusting the chrominance range and luminance levels using the Add/Remove Softness and Tolerance buttons. You can further modify a key using the Sharpness, Cleanup, Shrink, and Blur parameters.

NOTE To disable the Diamond Keyer at any time, right-click on the Keyer option box.

Before extracting a key, you can modify the source image by using the Input Transform Log to Lin and Soften options. See [Tools Settings](#) (page 93).

Use the following workflow to extract a key for colour isolation.

Step:	Refer to:
1. Access the Diamond Keyer.	See Accessing the Diamond Keyer (page 486).
2. Select the colour that you want to key.	See Sampling a Colour in the Diamond Keyer (page 487).
3. View your secondary to determine the range of colour to key.	See Viewing Secondaries in the Diamond Keyer (page 489).
4. Set the luminance levels and chrominance range for tolerance to extract in the key.	See Setting the Tolerance Range in the Diamond Keyer (page 490).

Step:	Refer to:
5. Set the luminance levels and chrominance range for softness to extract in the key.	See Setting the Softness Range in the Diamond Keyer (page 492).
6. Blend the light and dark edges of a key by shrinking, eroding, or blurring the edges of a key.	See Modifying the Edges of the Key (page 495).
7. Remove stray pixels from a key to clean it up for colour grading.	See Removing Stray Pixels from a Key (page 496).
8. Increase or decrease the softness of pixels that are in the tolerance range.	See Sharpening a Key Source Image (page 497).

The following procedures are not essential for extracting a key. You can perform these procedures any time after extracting a key.

Step:	Refer to:
1. Remove colours that you do not want to include in the key.	See Inverting Keys (page 497).
2. Exclude a key that you do not want to appear in a secondary.	See Excluding Keys from Secondaries (page 498).

Accessing the Diamond Keyer

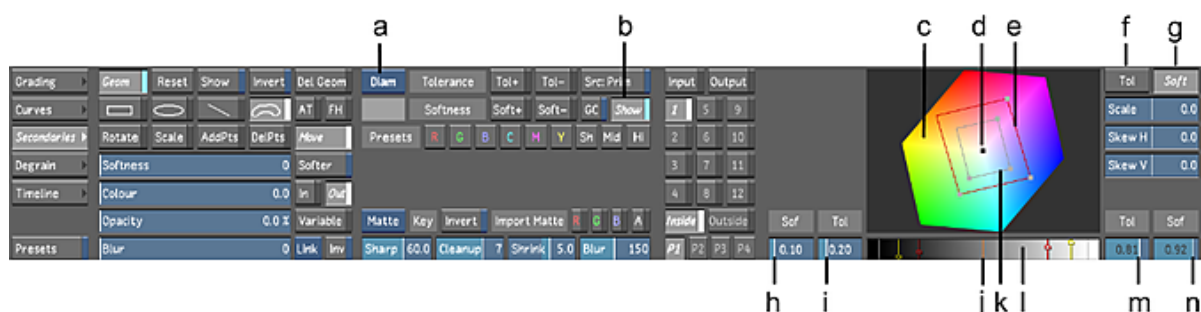
Use the comprehensive controls in the Diamond Keyer to extract a key.

To access the Diamond Keyer:

- 1 In the Secondaries menu, toggle the Keyer option box to access the Diamond Keyer.

The Diamond Keyer interface appears.

NOTE Disable the Show button to display the Shape Tracker, Schematic, Notes, Flags, Pixel, Animation, Group, and Selector panels.



(a) Keyer option box (b) Show Diamond Keyer (c) Hue cube (d) Sampled pixel (e) Chrominance Softness Diamond selector (f) Chrominance Tolerance Diamond selector (g) Chrominance Softness Diamond selector (h) Minimum Luminance slider for softness (i) Minimum Luminance slider for tolerance (j) Luminance level of sampled pixel (k) Chrominance Tolerance Diamond (l) Luminance gradient (m) Maximum Luminance slider for tolerance (n) Maximum Luminance slider for softness

The Diamond Keyer interface is made up of the following elements.

Keyer option box Toggles to display the HLS Keyer or the Diamond Keyer. The default keyer is configured in the user settings. See [Tools Settings](#) (page 93).

Show Displays the Diamond Keyer. Disable to display the Shape Tracker, Schematic, Notes, Flags, Pixel, Animation, Group, and Selector menus.

Hue cube Representation of the colour space in which you perform colour isolation for the extraction of a key.

Sampled pixel Black dot represents the sampled colour on the hue cube.

Chrominance Softness Diamond Used to set the chrominance range for softness.

Chrominance Tolerance Diamond selector Selects the chrominance Tolerance Diamond for scaling and skewing.

Chrominance Softness Diamond selector Selects the chrominance Softness Diamond for scaling and skewing.

Minimum Luminance slider for softness Used to set the minimum luminance levels for softness.

Minimum Luminance slider for tolerance Used to set the minimum luminance levels for tolerance.

Luminance level of sampled pixel Orange bar represents the luminance level of the sampled pixel in the Luminance gradient.

Chrominance Tolerance Diamond Used to set the chrominance range for tolerance.

Luminance gradient Displays the level of luminance for the sampled pixel and the Minimum and Maximum luminance levels for tolerance and softness.

Maximum Luminance slider for tolerance Used to set the maximum luminance level for tolerance.

Maximum Luminance slider for softness Used to set the maximum luminance level for softness.

Sampling a Colour in the Diamond Keyer

The typical way to extract a key is to sample a pixel or an average colour in the image using the colour picker. Lustre also provides colour presets as a starting point for the key. You can also use previously saved keyer presets. See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

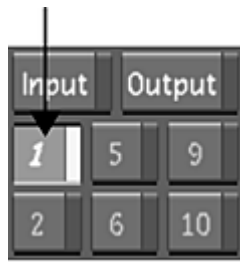
To sample a colour:

- 1 Set the view mode to Output. You can click the O button.

NOTE Pressing **F12** to set the view mode to Output only works from Matte view.



- 2 In the secondary layers panel, activate a layer.



NOTE If you do not activate the secondary layer, the colour pot will not be updated with your colour sample.

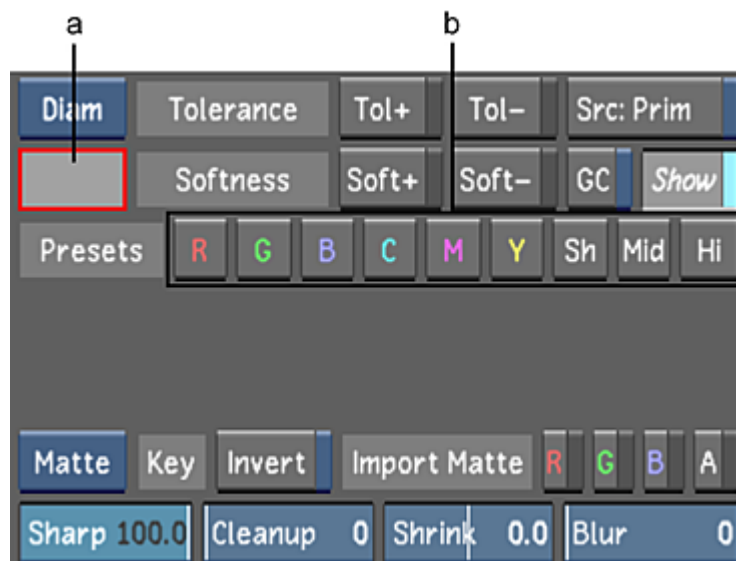
- 3 Right-click the Keyer option box to enable the Diamond Keyer.
The letters in the Keyer option box turn bright white indicating that the Diamond Keyer is enabled.
- 4 Enable the Source Primary button to use primary grading results as the input to a key.

NOTE When Src: Prim is disabled, the raw scan is used as the input to the keyer, effectively bypassing any input LUTs and primary grading that have been applied to your shot.



(a) Source Primary button (b) Log to Lin button (c) Soften slider

- 5 Enable the Log to Lin button. See [Tools Settings](#) (page 93).
- 6 Adjust the Soften slider. See [Tools Settings](#) (page 93).
- 7 To sample a colour, do one of the following:
 - Click the colour pot.
The colour pot is outlined in red.
 - Click a Presets option.
The colour presets allow you to quickly select a starting point for your key. The R, G, B, C, M, and Y colour presets position the chrominance Tolerance and Softness Diamonds in the corresponding regions of the hue cube. The Sh (shadow), Mid (midtones), and Hi (highlights) presets select luminance ranges along the luminance axis.



(a) Colour pot (b) Presets options

8 Sample the image:

- To sample a single pixel, click and drag in the image until you locate the pixel you want to sample. As you drag, the colour of the current pixel appears in the colour pot. When you locate the pixel you want to sample, release the mouse.
- To sample an average taken from a range of colours in the image, Alt-drag the image in the Player.

The cursor changes to a colour picker when you move it over the image in the Player. When you release the mouse, the initial chrominance range is set for softness and tolerance on the hue cube, and the colour pot displays the sampled colour.

NOTE The chrominance of the sampled colour is represented by a black dot on the hue cube and the luminance of the sampled colour is represented by an orange bar in the Luminance gradient.

9 If the colour pot is enabled, click it again to finish defining the colour.

Viewing Secondaries in the Diamond Keyer

keys:viewing resultssecondary colour grading:viewing key resultsHLS Keyer:viewing secondariesDiamond Keyer:viewing secondariesOnce you have sampled a colour for the key, you can view the resulting secondary in the Player. You can view the key in Secondary view or Matte view by toggling the F11 key. Secondary view displays the keyed out colour as is; unsampled colours are overlaid with a uniform colour by default. Matte view displays the alpha channel, a black and white template indicating which parts of the image are transparent (black), and which are opaque and selected (white). The white parts of the image can be colour graded.

To view a secondary:

- 1 Select the secondary you want to view.
- 2 Display the image in Secondary view by pressing F11.

In Secondary view, the colour that is keyed out in the current secondary is unchanged; unsampled colours are overlaid with a uniform colour by default. See [Matte Overlay Settings](#) (page 119).



- 3 Press **F11** to display Matte view.

In Matte view, the white parts of the matte represent the selected colours that can be colour graded. The black parts represent the unselected colours in the secondary. Greys indicate the zone of softness.



Setting the Tolerance Range in the Diamond Keyer

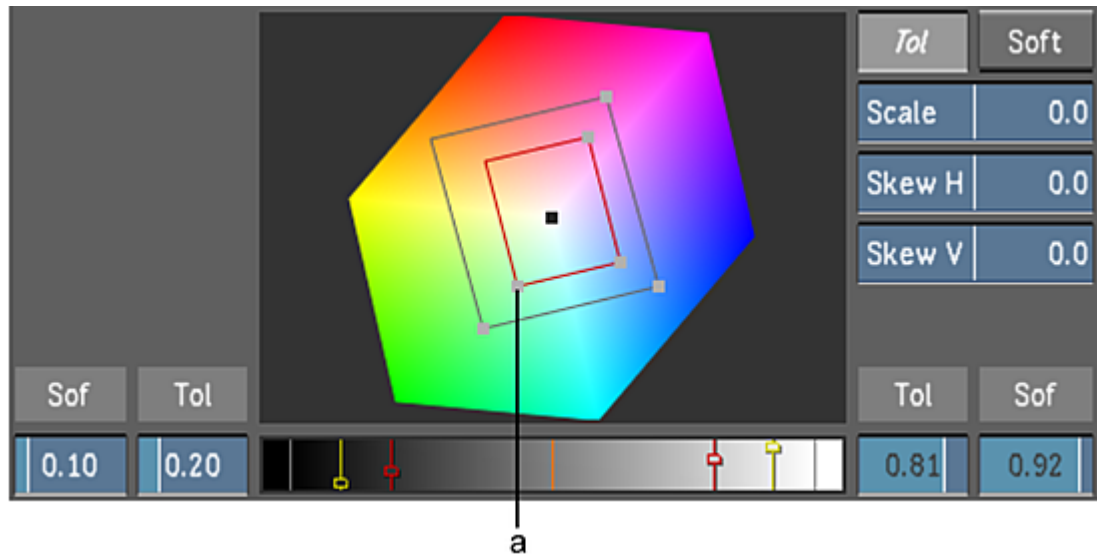
tolerance:setting for keys, Diamond KeyerDiamond Keyer:setting tolerance rangeYou can set the tolerance for a range of colours to be fully keyed (transparent) and to remove unwanted greys from the key. You can modify the chrominance and luminance levels for tolerance across the entire image or just in the shadows, midtones, and highlights. The Tolerance Diamond defines the range of colours included in the secondary.

To set the chrominance range for tolerance, you can manipulate the Tolerance Diamond or sample the chrominance and luminance of the image using the Add Tolerance and Remove Tolerance buttons. You can also use the Minimum and Maximum Luminance sliders to set the luminance levels for tolerance.

To set the chrominance range for tolerance by moving and modifying the Tolerance Diamond:

- 1 View the secondary in the Player. Press **F11** to toggle to Secondary view.
In Secondary view, you can see the effect of the modifications you make to the chrominance range for tolerance while you fine-tune the key.
- 2 Click and drag the Tolerance Diamond or click and drag a vertex of the Tolerance Diamond.

NOTE If the Tolerance Diamond vertex is too small to drag with the mouse, you can use the scale and skew controls to expand the diamond. See [Using the Scale and Skew Controls in the Diamond Keyer](#) (page 494). You can also zoom in and out on the hue cube. Right-click and drag to the right to zoom in or drag to the left to zoom out. The Tolerance Diamond is red when selected and grey when unselected.

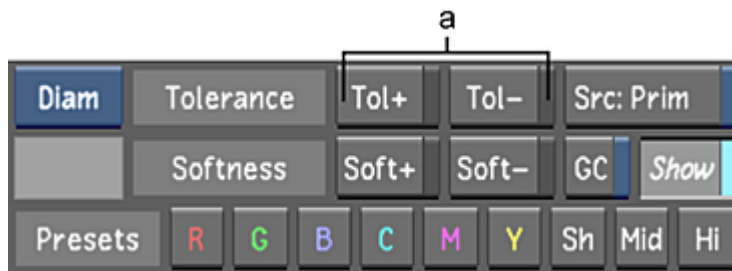


(a) Tolerance Diamond vertex

The chrominance range for tolerance is modified.

To set the luminance levels and chrominance range for tolerance using the Add/Remove Tolerance buttons:

- 1 View the secondary in the Player. Press F11 to toggle between Secondary view and Matte view.
- 2 In the Secondaries menu, enable the Add Tolerance or Remove Tolerance button to increase or decrease the chrominance and luminance levels for tolerance.

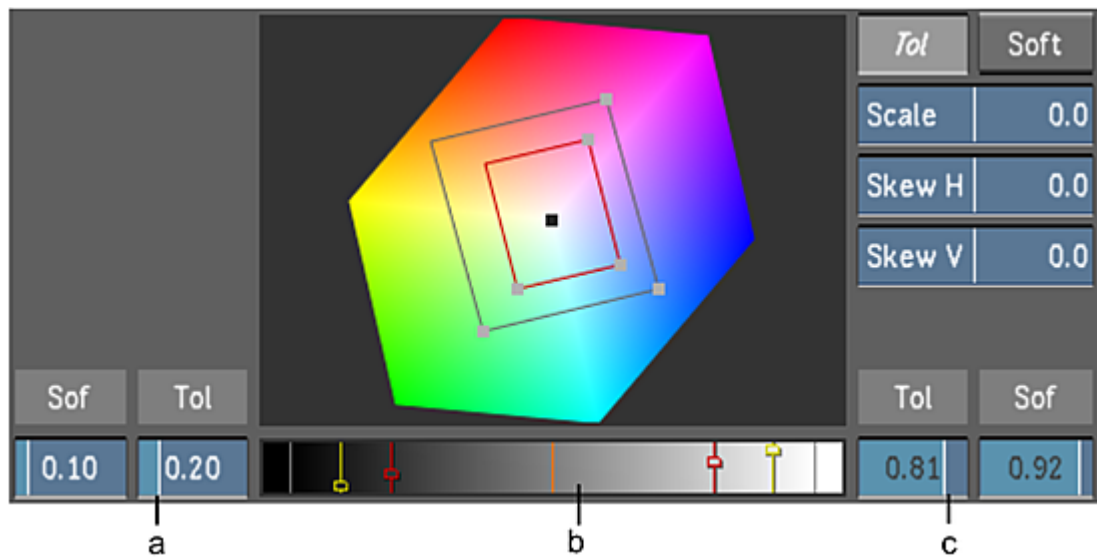


(a) Add Tolerance and Remove Tolerance buttons

- 3 Click or drag in the image. Alt-drag in the image to select a larger area.
The chrominance range and luminance levels for tolerance are modified.

To set the luminance levels for tolerance using the Minimum and Maximum Luminance sliders:

- 1 View the secondary in the Player. Press F11 to toggle to Matte view.
In Matte view, you can see the effect of the modifications you make to the luminance levels for tolerance while you fine-tune the key.
- 2 Drag the Minimum and Maximum Luminance sliders (next to the Luminance gradient) to set the luminance levels for tolerance.



(a) Minimum Luminance slider for tolerance (b) Luminance gradient (c) Maximum Luminance slider for tolerance

NOTE As you move the Minimum and Maximum Luminance sliders for tolerance, the luminance levels are represented in the Luminance gradient by corresponding red markers.

The luminance levels for tolerance are modified.

Setting the Softness Range in the Diamond Keyer

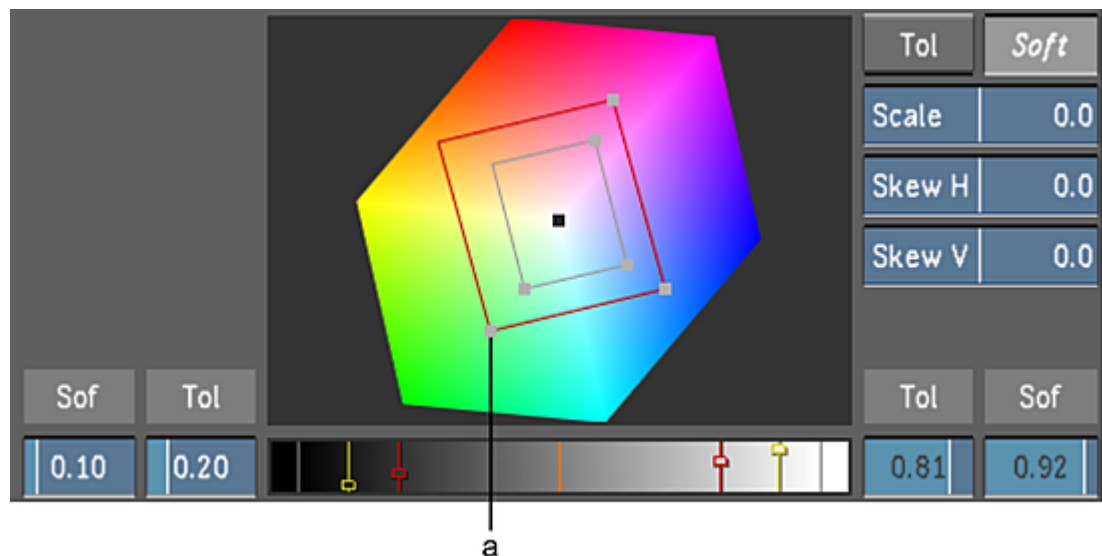
softness:setting range for keys, Diamond Keyerkeys:setting softness range, Diamond KeyerOnce you have set the tolerance range, you can then set the softness range. Softness sets the range of colours to make semi-transparent and creates a softer key. Use softness to create a more natural and softer look when applying secondary colour correction.

To set the chrominance range for softness, you can manipulate the chrominance Softness Diamond. You can use the Add Softness and Remove Softness buttons to set the chrominance range and luminance levels for softness. You can also use the Minimum and Maximum Luminance sliders to set the luminance levels for softness.

To set the chrominance range for softness by moving and modifying the Softness Diamond:

- 1 View the secondary in the Player. Press F11 to toggle to Secondary view.
In Secondary view, you can see the effect of the modifications you make while you fine-tune the key.
- 2 Click and drag the Softness Diamond or click and drag a vertex of the Softness Diamond.

NOTE If the Softness Diamond vertex is too small to drag with the mouse, you can use the scale and skew controls to expand the diamond. See [Using the Scale and Skew Controls in the Diamond Keyer](#) (page 494). You can also zoom in or out on the hue cube. Right-click and drag to the right to zoom in or drag to the left to zoom out. The Softness Diamond is red when selected and grey when unselected.

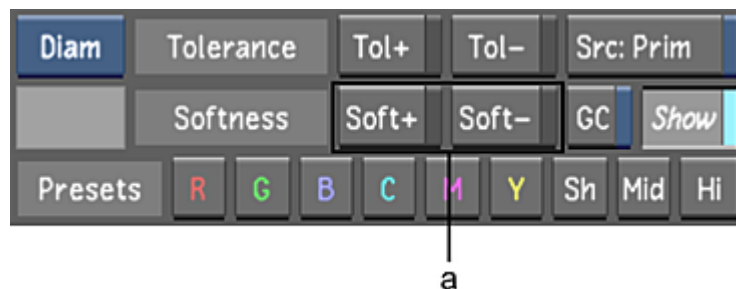


(a) Softness Diamond vertex

The chrominance range for softness is modified.

To set the chrominance range and luminance levels for softness using the Add Softness and Remove Softness buttons:

- 1 View the secondary in the Player. Press F11 to toggle between Secondary view and Matte view.
- 2 In the Secondaries menu, enable the Add Softness or Remove Softness button to increase or decrease the chrominance range and luminance levels for softness.

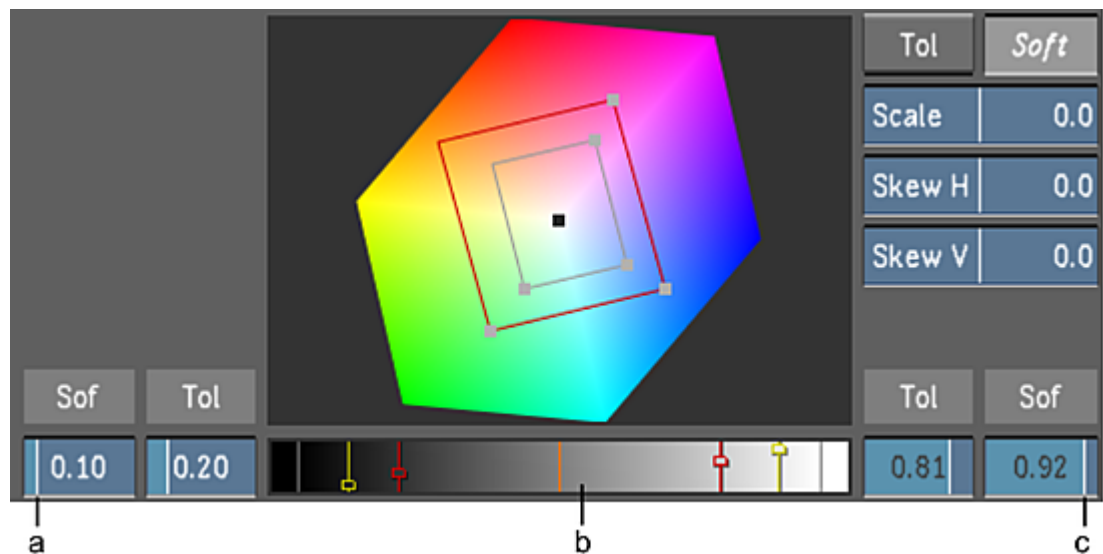


(a) Add Softness and Remove Softness buttons

- 3 Click or drag in the image. Alt-drag in the image to select a larger area.
The chrominance and luminance levels for softness are modified.

To set the luminance levels for softness using the Minimum and Maximum Luminance sliders:

- 1 View the secondary in the Player. Press F11 to toggle to Matte view.
In Matte view, you can see the effect of the modifications you make while you fine-tune the key.
- 2 Drag the Minimum and Maximum Luminance sliders (next to the Luminance gradient) to adjust the luminance levels for softness.



(a) Minimum Luminance slider for softness (b) Luminance gradient (c) Maximum Luminance slider for softness

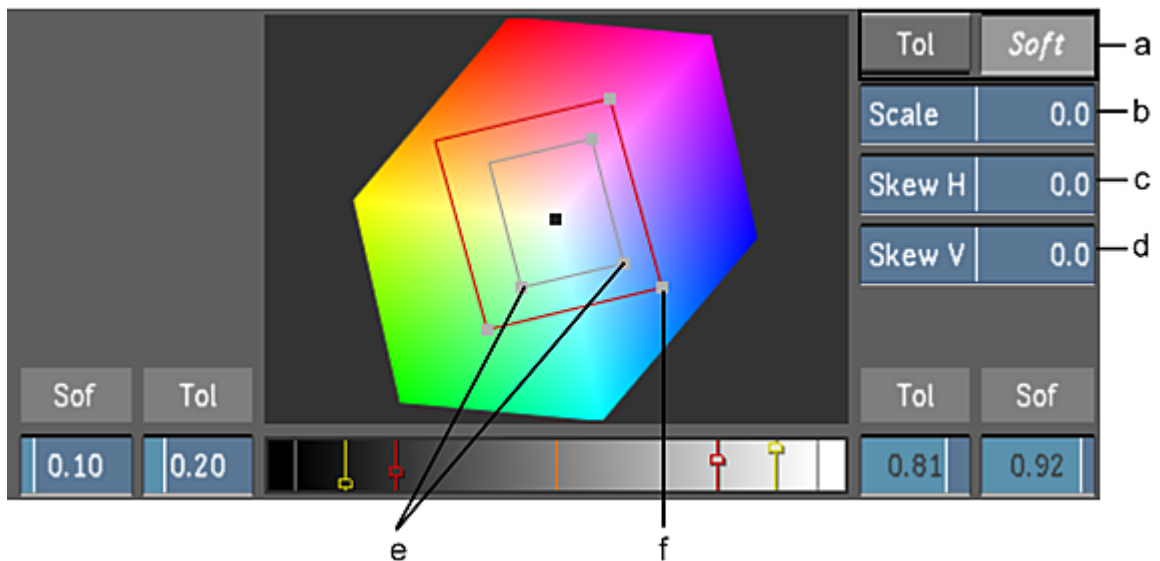
NOTE As you move the Minimum and Maximum Luminance sliders for softness, the luminance levels are represented in the Luminance gradient by corresponding yellow markers.

The luminance levels for softness are modified.

Using the Scale and Skew Controls in the Diamond Keyer

skewing geometriesDiamond Keyer:skewing geometriesscaling geometriesDiamond Keyer:scaling geometriesgeometries:scalinggeometries:skewingWith the Scale control, you can scale the chrominance Softness and Tolerance Diamonds to increase or decrease the range of colour to isolate. With the Skew controls, you can skew the chrominance Softness and Tolerance Diamonds horizontally and vertically relative to the orientation of the selected diamond to increase or decrease the range of colour to isolate.

NOTE To zoom in or out on the hue cube, right-click and drag to the right to zoom in or drag to the left to zoom out.



(a) Tolerance and Softness selectors (b) Scale slider (c) Skew Horizontal slider (d) Skew Vertical slider (e) Horizontal control vertices (f) Vertical control vertex

To scale the range of colour:

- 1 View the secondary in the Player. Press F11 to toggle to Secondary view.
In Secondary view, you can see the effect of the modifications you make while you fine-tune the key.
- 2 Click the Tolerance button or Softness button to select the Tolerance Diamond or Softness Diamond.
- 3 Drag the Scale slider to the left or to the right to decrease or increase the range of colour to isolate.

To skew the range of colour horizontally:

- 1 View the secondary in the Player. Press F11 to toggle to Secondary view.
In Secondary view, you can see the modifications you make to the chrominance range while you fine-tune the key.
- 2 Click the Tolerance button or Softness button to select the Tolerance Diamond or Softness Diamond.
- 3 Depending on the orientation of the diamond, drag the Skew slider to the left to horizontally decrease the range of colour to isolate or to the right to horizontally increase the range of colour to isolate.

To skew the range of colour vertically:

- 1 View the secondary in the Player. Press F11 to toggle to Secondary view.
In Secondary view, you can see the modifications you make to the chrominance range while you fine-tune the key.
- 2 Click the Tolerance button or Softness button to select the Tolerance Diamond or Softness Diamond.
- 3 Depending on the orientation of the diamond, drag the Skew slider to the left to vertically decrease the range of colour to isolate or to the right to vertically increase the range of colour to isolate.

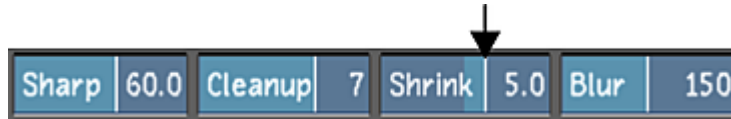
Modifying the Edges of the Key

blurring:edges of keysedges, modifying for keyskeys:shrinking edgesshrinking:edges of keyskeys:blurringYou can shrink, erode, or blur the edges of a key. Shrink a key to remove pixels from the edge of the key. Erode a key to blend the light and dark edges. Blur a key to apply a softening filter to its edge.

NOTE The following steps apply to both the HLS and Diamond Keyers.

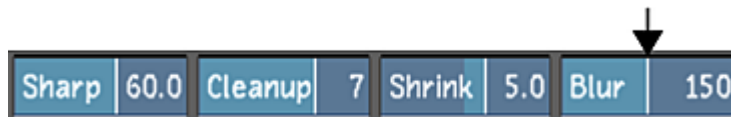
To shrink or erode the edge of the key:

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 Fine-tune the edge of the key:
 - To shrink the edge of the key, drag the Shrink slider to the left.
 - To erode the edge of the key, drag the Shrink slider to the right.



To blur the edge of the key:

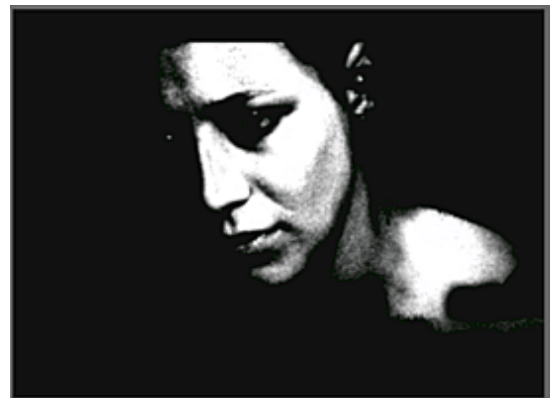
- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 Drag the Blur slider to the right.



The edge of the key is softened.



Before



After

Images courtesy of Hungarian Academy of Film & Theatre, 3rd year

Removing Stray Pixels from a Key

pixels, removing from keyskeys:removing stray pixels fromWhen you extract a key, pixels in other parts of the image may be included. You can remove these stray pixels from the key to clean it up for colour grading.

NOTE The following steps apply to both the HLS and Diamond Keyers.

To remove stray pixels:

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 Drag the Cleanup slider to the right to apply a median filter to remove stray pixels.



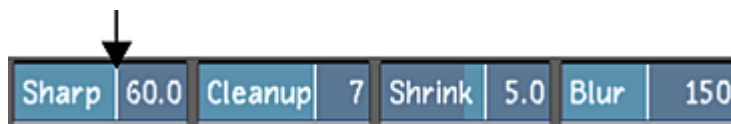
Sharpening a Key Source Image

Sharpen a key source image to increase or decrease the softness of only the pixels that are within the chrominance and luminance range for tolerance.

NOTE This procedure applies to the Diamond Keyer only.

To sharpen a key:

- 1 View the secondary in the Player. Press F11 to toggle between Matte view and Secondary view.
- 2 Drag the Sharpness slider to adjust softness and reduce noise if the matte appears grainy.



Inverting Keys

inverting:keyskeys:invertingInvert a key when it is easier to exclude rather than include colours in a secondary.

NOTE The following steps apply to both the HLS and the Diamond Keyers.

To invert a key:

- 1 In the Secondaries menu, toggle the Matte/Key-in option box to display the Key Invert panel, and then enable Invert.



The area of the key that was opaque becomes transparent and the area that was transparent becomes opaque.



Before



After

Images courtesy of Hungarian Academy of Film & Theatre, 3rd year

Excluding Keys from Secondaries

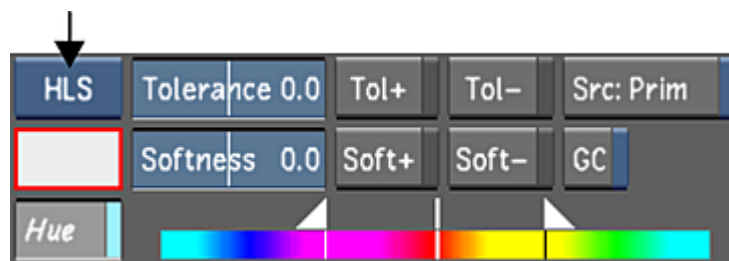
secondary colour grading:excluding keyskeys:excluding from secondariesYou can exclude keys from secondaries. When you exclude a key from a secondary that includes a geometry, only the geometry is colour graded.

NOTE The following steps apply to both the HLS and the Diamond Keyers.

To exclude a key from a secondary:

- 1 In the Secondaries menu, select and then right-click the Secondary button that contains the key you want to exclude.

If a key is included with the secondary, the keyer is enabled.



TIP Click M in the View Mode buttons and then toggle the F11 key to display the Matte view.

- 2 Right-click the Keyer option box to disable the current Keyer.

NOTE The HLS and Diamond Keyer letters turn from bright white to faded white, indicating that the keyer is disabled.



The key is excluded from the colour grade. The whole image or the areas defined by a geometry will be colour graded by the secondary.

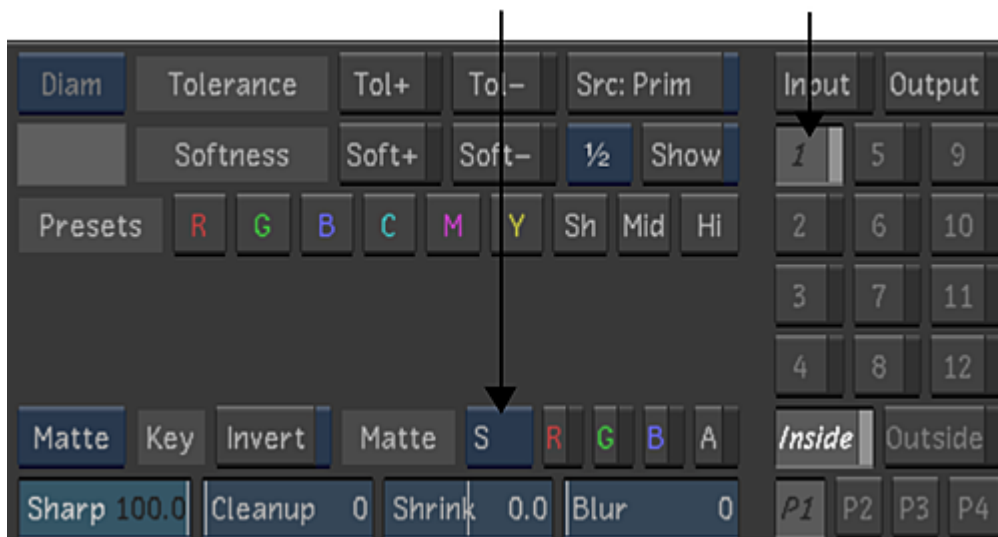
Saving and Loading Key Presets

presets:saving and loading for keyskeys:saving and loading presetsYou can save user-defined keys, or previously saved keyer presets. You can then quickly load them to the current shot for comparison. See [Saving and Loading Presets Using the Presets Lists](#) (page 407).

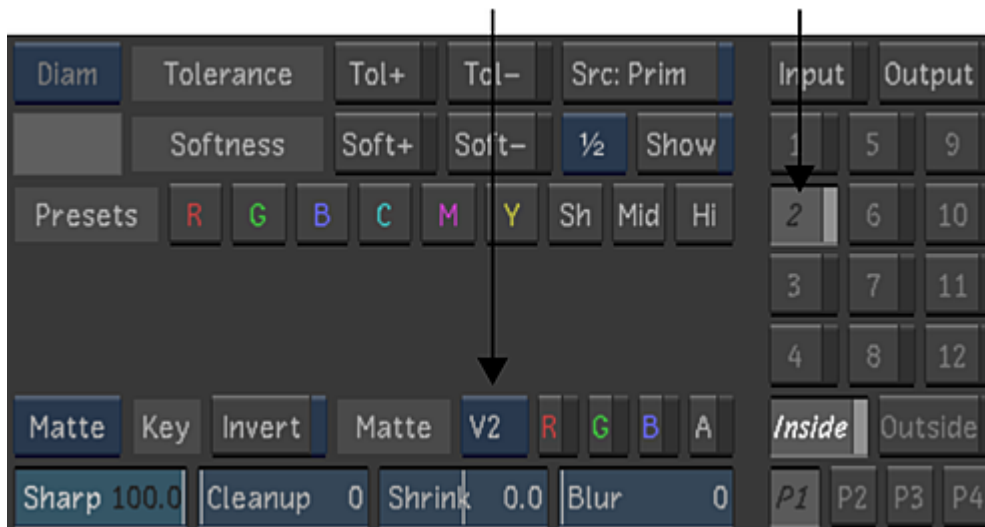
Working with Mattes



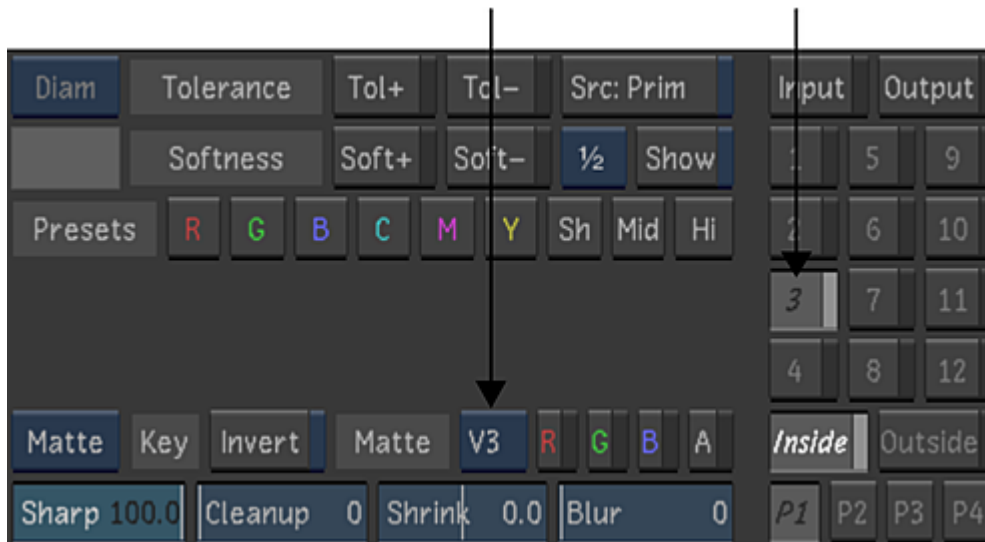
In the following screenshot, the matte on the secondary track is applied to the first secondary colour grading layer.



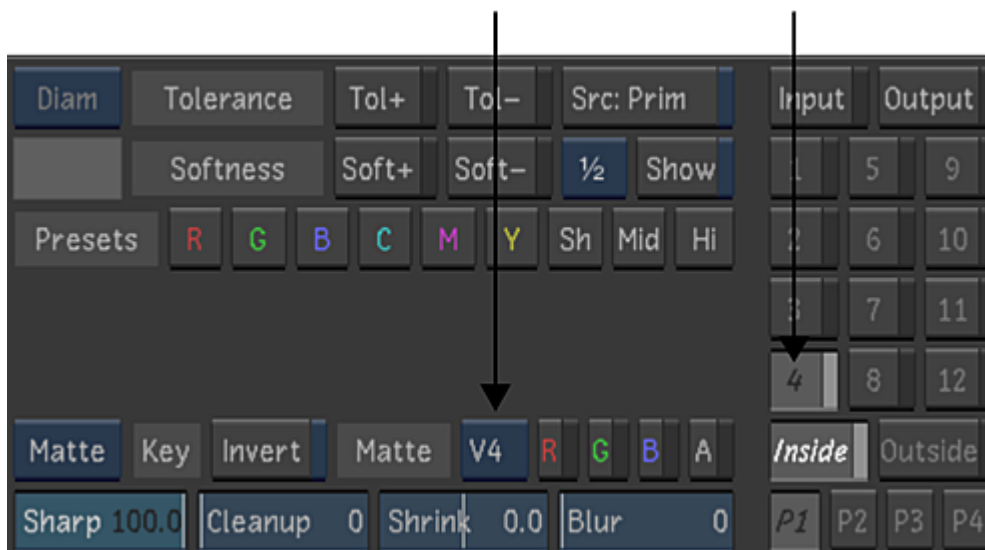
In the following screenshot, the matte on the V2 track is applied to the second secondary colour grading layer.



In the following screenshot, the matte on the V3 track is applied to the third secondary colour grading layer.



In the following screenshot, the matte on the V4 track is applied to the fourth secondary colour grading layer.



NOTE If the matte you are using does not contain an alpha channel, the alpha button is not available.

NOTE Playback performance may vary based on the number of active mattes, file formats, resolution, storage bandwidth and type of project. For example, if you have two matte tracks in a matte container that are both being used on secondaries, three playback streams of media are required. You may not achieve real-time playback based on storage bandwidth, graphics card processing, etc. Performance may also be compromised if you are working with dissolves or stereoscopic timelines.

Shape Tracker

shape tracker:tracking through translation, rotation, scaling, partial occlusionssshape tracker:point cloudshape tracker:region of interestThe Shape Tracker tool is a 2-dimensional tracking device that allows you to track objects within your shot. It allows you to create a geometry around the object you want to track, analyse the object through the shot, and then grade the geometry.

To use the Shape Tracker you need to define a region of interest (ROI) by drawing a geometry around the object you want to track. The area inside this geometry is where Lustre searches for trackable points. This group of trackable points is called a point cloud. By tracking a cloud instead of a single point, Lustre can track shapes through translation, rotation, and scaling.

In order to track a shape properly, the ROI needs to be large enough so there are enough trackable points in the point cloud. If the ROI is large enough, the object in the shot will be tracked properly. If the object you want to track is small and does not contain enough trackable points, you need to link the smaller graded geometry to a larger tracked geometry.

The Shape Tracker Panel

To track 2D shapes within a shot, you need to enable the Shape Tracker tool and create an ROI.

To access the Shape Tracker panel and create an ROI:

- 1 In the Main menu click Colour.
- 2 Click Secondaries.

The Secondaries menu with the Shape Tracker panel appears.

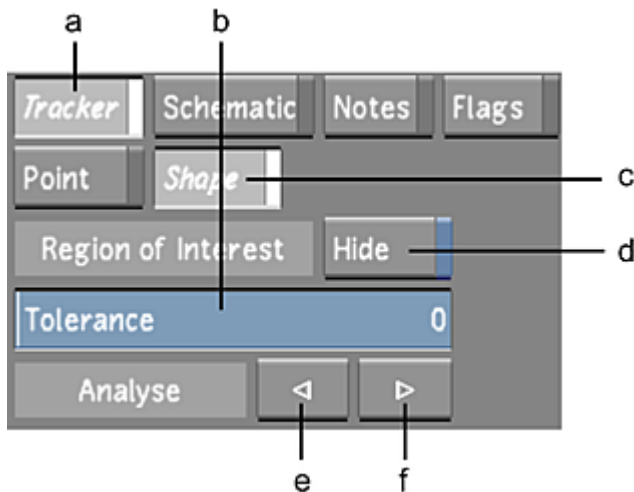


NOTE When the Diamond Keyer is selected, disable the Show button to display the Shape Tracker panel (as well as the Schematic, Notes, Flags, Pixel, Animation, Group, and Selector panels).



Parts of the Shape Tracker

The Shape Tracker is made up of the following components.



(a) Tracker button (b) Tolerance slider (c) Shape button (d) Hide button (e) Analyse backward button (f) Analyse forward button

Tracker button Enables the tracking option (Point Tracker or Shape Tracker).

Tolerance slider Defines the tolerance level of the Shape Tracker analysis. The range is from 0 to 10.

A tolerance level of 0 (low tolerance) means the object that is being tracked does not change in shape throughout the shot. If an external object passes in front of the tracked object, a low tolerance ensures that the motion of the external object does not get tracked through the analysis.

A tolerance level of 10 (high tolerance) means the object which is being tracked has a slight change in shape throughout the shot. For example, there is slight 3D movement from the shape. If you have set the tolerance level to high, external objects that pass in front of the tracked object may be included in the analysis.

Shape button Enables the Shape Tracker tool.

Hide button When enabled, it hides the selected geometry and grading (if applicable). You can also use the hotkey, left `Ctrl+H`, to hide and show the geometry.

Analyse backward button When selected, the Shape Tracker analyses the object within the selected ROI from your insertion point to the beginning of the shot.

Analyse forward button When selected, the shape tracker analyses the object within the selected ROI from your insertion point to the end of the shot.

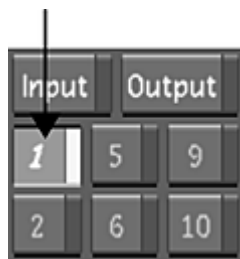
Tracking an Object using Shape Tracker

There are two ways to use the Shape Tracker. If you can create a large enough ROI around the object you want to track, you can use the Shape Tracker to track the object and then grade the same geometry. If the object you want to track and grade is small and it does not have enough trackable points to use the Shape Tracker effectively, you need to track a larger ROI, create a graded geometry of the smaller object, and link the ROI geometry to the graded geometry.

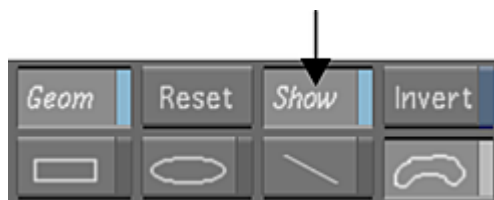
The following procedure is used when the object has a large enough ROI to track.

To track an object within a shot:

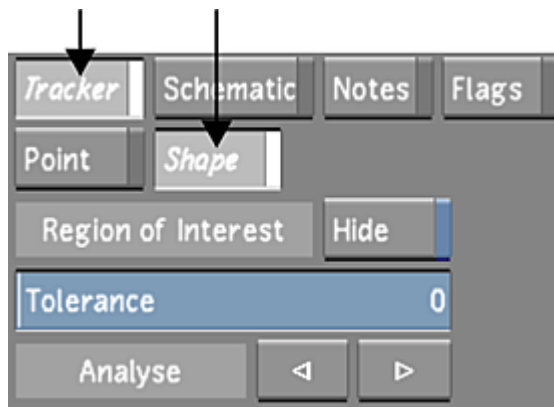
- 1 Make sure you are on the first frame of where you want the tracking to start.
- 2 In the Secondaries menu, right-click a secondary layer to activate it.



- 3 Click Show



- 4 Enable the Shape Tracker tool by clicking on Tracker and Shape.



- 5 Create an ROI by drawing either a basic or free-form geometry around the object you want to track. See [Drawing Basic Geometries](#) (page 453) and [Drawing Free-Form Geometries](#) (page 454).

NOTE Make sure your ROI is as large as possible, without including too many non-rigid shapes, in order to give Shape Tracker a sufficient area to analyse.

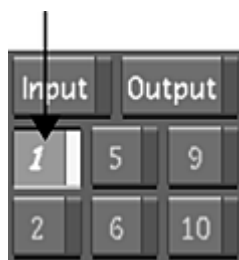
- 6 Make sure the geometry you want to track is selected.
The axis of the geometry should be yellow.
- 7 Set the tolerance slider between 0-10.
- 8 Click the analyse backward, or analyse forward button, to analyse the shot segment.
When the analysis is complete, you can grade the geometry.

NOTE If the analysis stops before the end of the shot or it does not begin at all, the ROI area may be too small to track. Refer to the following procedure below.

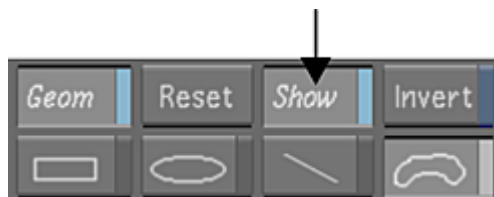
The following procedure is used if the object you want to track is small and does not contain enough trackable points.

To track a small object that does not contain enough trackable points:

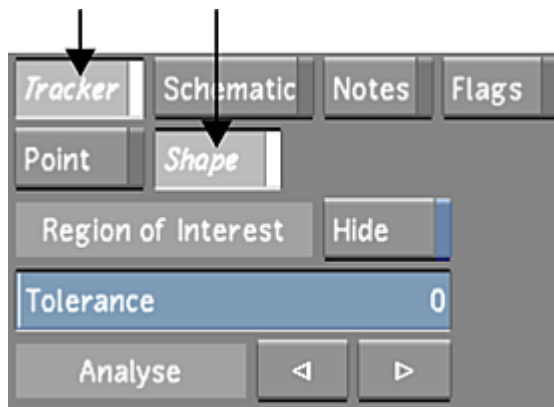
- 1 Make sure you are on the first frame of where you want the tracking to start.
- 2 In the Secondaries menu, right-click a secondary layer button to activate it.



- 3 Click Show.



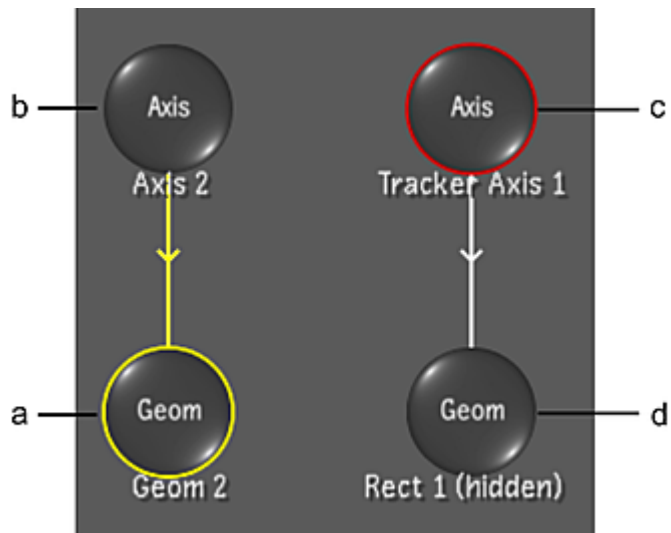
- 4 Enable the Shape Tracker tool by clicking on Tracker and Shape.



- 5 Create an ROI by drawing a basic geometry around a large area in the shot. See [Drawing Basic Geometries](#) (page 453).

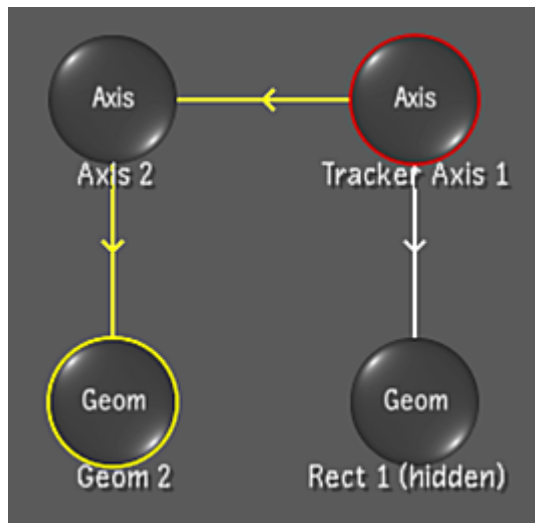
NOTE Depending upon your shot, the large ROI area may or may not contain the smaller object you want to track.

- 6 Make sure the geometry you want to track is selected.
The axis of the geometry should be yellow.
- 7 Set the tolerance slider between 0-10.
- 8 Click the analyse backward, or analyse forward button, to analyse the shot segment.
The analysis is now complete.
- 9 Click Hide.
The tracked geometry is now hidden.
- 10 Create a geometry around the object you want to grade.
- 11 Grade this new geometry.
- 12 Press ~ (the tilde key) to enter the Schematic view.
You should see the axis and geometry of the tracked shape and the graded shape.



(a) Geometry of graded shape (b) Axis of graded shape (c) Axis of ROI (d) Geometry of ROI

- 13 Position your cursor over the edge of the circle representing the ROI axis and left-click and drag a line to the edge of the circle representing the graded shape axis.



The graded shape is now linked to the ROI and therefore follows its tracked path.

14 Press ~ to return to the Player view.

Animating the Point Tracker

point tracker:animating geometries withshape tracker:animating geometries withanimating:geometries with the shape trackeranimating:geometries with the point trackergeometries:animating with the shape trackergeometries:animating with the point trackerPoint Tracker is a useful tool for tracking points through a shot. In situations where tracking a point cloud is impossible, Point Tracker provides an excellent alternative. For example, if Shape Tracker's ROI provides no rigid shapes to track, Point Tracker's ability to track a point remains the best choice. With Point Tracker, you can animate a geometry by applying tracking data to it. Users can assign one or several trackers to a geometry. This is useful when you want a geometry to follow a moving element in a shot. With Point Tracker, you can:

- Animate the position of an entire geometry without changing its shape by assigning a tracker to the geometry's axis.
- Animate the shape of a geometry by assigning a tracker to each vertex. If you are animating a basic geometry, convert it to a free-form geometry first.

When you apply tracking data to a geometry, only the axis or the position of the vertices is animated. Because you can assign multiple trackers to a geometry, you can assign trackers to both its axis and vertices.

Tracking data appears in the Channel Editor. Tracking data for each tracker is contained in a Trackers directory of the channel hierarchy. Use the channel hierarchy to select the tracker and then modify the tracking data. In the channel hierarchy, the channels for each tracker appear.

Tracker Channel	Description
Ref X	The point being tracked on the X-axis
Ref Y	The point being tracked on the Y-axis
Track X	Last tracked (or current) tracker position along the X-axis
Track Y	Last tracked (or current) tracker position along the Y-axis

You can also animate the softness of geometries and the position of their individual vertices using the Animation controls. See [Animation](#) (page 541).

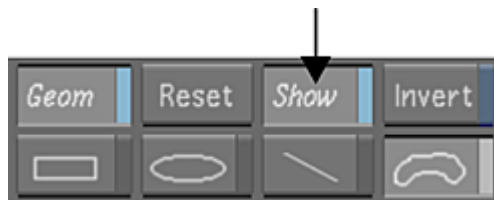
The Point Tracker is further improved with sub-pixel accuracy. Subsequently, any subtle movement (including movements less than a single pixel in dimension) can now be analysed and written to the Lustre Animation Channel.

Animating the Position of Geometries

You can animate the position of geometries by defining a Point Tracker and assigning it to the axis of the geometry.

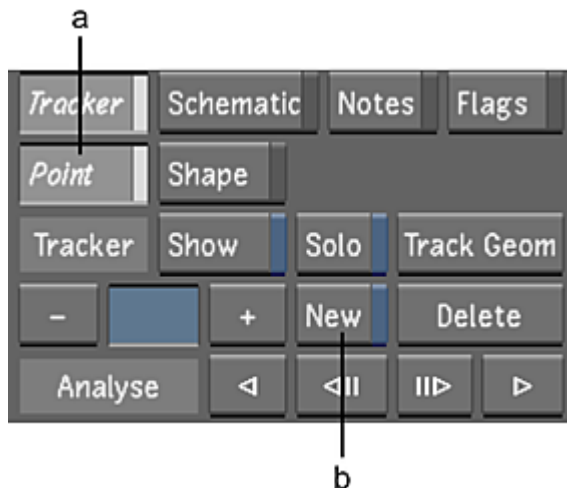
To animate the position of a geometry with the Point Tracker:

- 1 In the Secondaries menu, activate the secondary layer button that contains the geometry you want to track.
- 2 Click Show.



- 3 The Point Tracker option should already be enabled by default.

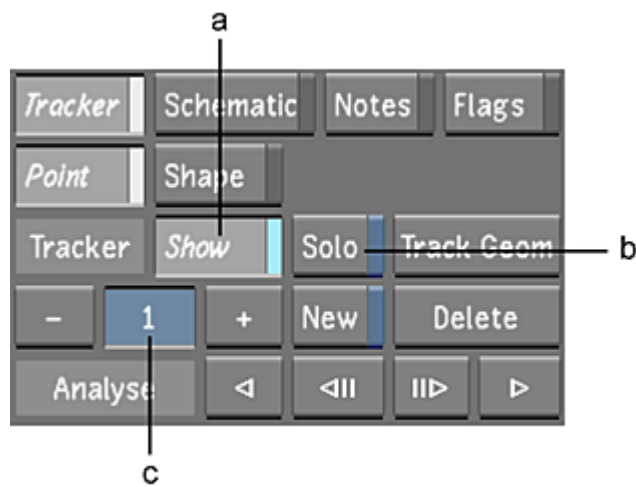
NOTE When the Diamond Keyer is selected, disable the Show button (beneath the Source Primary button) to display the Tracker panel.



(a) Point Tracker button (b) New button

- 4 Enable a new tracker by clicking New.
- 5 In the Player, go to the frame where you want to start tracking, and then click a tracking point in the image.

In the Player, the tracker is assigned to, and positioned over, the tracking point. A tracker number is assigned to the tracker and the tracker is set to On.



(a) Tracker status (b) Solo/Gang button (c) Tracker list

When a tracker is on, it is displayed in the Player and can be analysed.

- 6 Disable the Solo/Gang button to select Solo mode.
In Solo mode, only the current tracker is analysed.
- 7 Use the Analyse buttons to analyse the shot:
 - To track the tracking point forward in time, click the Analyse Forward buttons.
 - To track the tracking point backward in time, click the Analyse Backward buttons.



(a) Analyse Backward buttons (b) Analyse Forward buttons

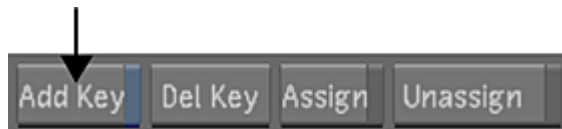
The system analyses the image and generates tracking data. For each frame in the shot, the position of the tracking point is displayed in the Player. The current position of the tracking point is highlighted in magenta.

- 8 Enable Assign.



- 9 In the Player, click the geometry's axis.
The tracker is assigned to the geometry's axis or vertex.
 - 10 If the tracker loses the tracking point, click the image to stop the process, and then use the Step Backward or Step Forward button in the Player controls to return to the last frame that was correctly tracked.
 - 11 In the Player, do any of the following:
 - To resize the tracker, modify the Match area (magenta rectangle) and Search area (yellow rectangle) by dragging the vertices of the rectangles.
 - To reposition the tracker, drag the centre point of the tracker.
 - To reposition the tracker and reference point, middle-click and drag the centre point of the tracker.
- TIP** You can reposition the tracker and reference point when the reference point moves off-screen.
- 12 Continue using the Analyse buttons to analyse the shot.

- 13 To manually add or reposition a tracking point, go to the frame where you want to modify the tracking data, enable Add Key, and then click a tracking point in the image.



The position of the tracking point is displayed in the image.

- 14 To manually delete the position of a tracking point, go to the frame where you want to remove the tracking data, and then click Del Key.



The tracking data is deleted.

NOTE Linear interpolation is used to set the tracking position for frames without tracking data. For these frames, the previous defined tracking position and the next defined position are used to interpolate the tracking position.

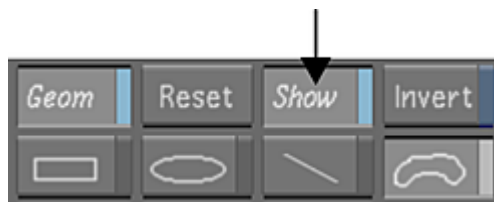
Animating the Shape of Geometries with the Point Tracker

animating:shape of geometries with the point trackergeometries:animating with the point trackerpoint tracker:animating the shape of geometriesYou can use the Track Geom button to animate the shape of a geometry when using Point Tracker. When you animate the shape of a geometry, the vertices of the geometry change position as the moving elements in the shot are tracked.

When you use Track Geom, a Point Tracker is simultaneously assigned to each vertex in the current geometry. You then analyse the shot to generate the tracking data.

To animate the shape of a geometry:

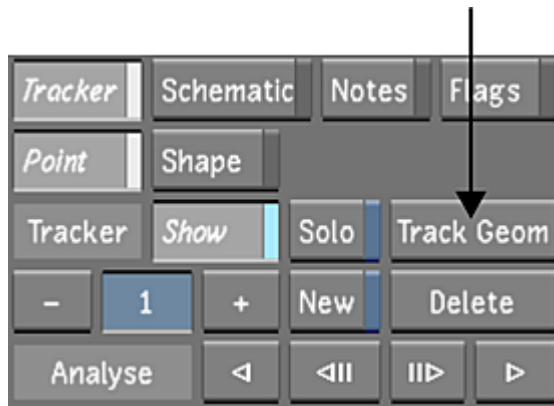
- 1 If working with a basic shape, right-click it in the Player to convert it to a free-form geometry.
- 2 In the Secondaries menu, activate the secondary layer button that contains the geometry you want to track.
- 3 Enable Show.



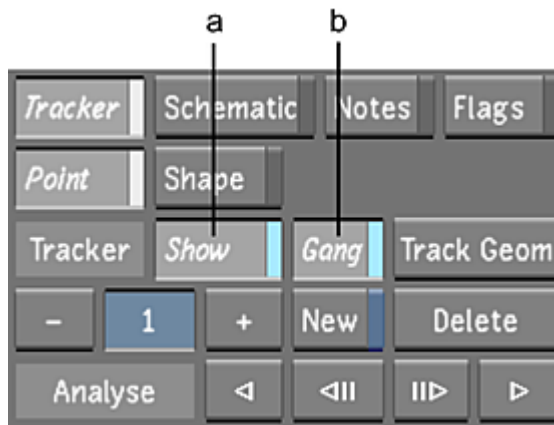
The geometries are displayed in the Player.

- 4 Go to the frame where you want to start tracking.
- 5 Select the geometry you want to track. In the Player, draw a selection box around the geometry to select all vertices on the shape. Alternatively, click a vertex to select it.
- 6 Click Track Geom.

NOTE When the Diamond Keyer is selected, disable the Show button (beneath the Source Primary button) to display the Tracker panel.



In the Player, a Point Tracker is assigned to, and positioned over, each vertex on the shape. A tracker number is assigned to each tracker. Gang mode is selected and the Point Trackers are turned on.



(a) Tracker status (b) Gang mode

When a Point Tracker is on, it is displayed in the Player and can be analysed. When Gang mode is selected, all Point Trackers assigned to the geometry (and any others included in the gang) will be analysed simultaneously.

NOTE If other Point Trackers exist, they will be turned off and hidden so as not to be included in the gang. However, if they are assigned to another geometry, their tracking data will still be applied.

- 7 Use the Analyse buttons to analyse the shot:
 - To track the tracking point forward in time, click the Analyse Forward button.
 - To track the tracking point backward in time, click the Analyse Backward button.



(a) Analyse Backward buttons (b) Analyse Forward buttons

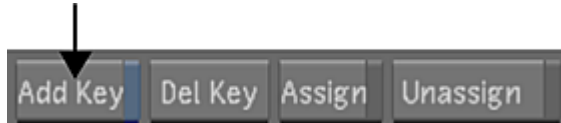
The system analyses the shot and generates the tracking data.

- 8 If the Point Tracker loses the tracking point, click the image to stop the process, and then use the Step Backward or Step Forward button in the Player controls to return to the last frame that was correctly tracked.

- 9 In the Player, do any of the following:
 - To resize the tracker, modify the Match area (magenta rectangle) and Search area (yellow rectangle) by dragging the vertices of the rectangles.
 - To reposition the Point Tracker, drag the centre point of the tracker.
 - To reposition the Point Tracker and reference point, middle-click and drag the centre point of the tracker.

TIP You can reposition the Point Tracker and reference point when the reference point moves off-screen.

- 10 Continue using the Analyse buttons to analyse the shot.
- 11 To manually add or reposition a tracking point, go to the frame where you want to modify the tracking data, enable Add Key, and then click a tracking point in the image.



The position of the tracking point is displayed in the image.

- 12 To manually delete the position of a tracking point, go to the frame where you want to remove the tracking data, and then click Del Key.



The tracking data is deleted.

NOTE Linear interpolation is used to set the tracking position for frames without tracking data. For these frames, the previous defined tracking position and the next defined position are used to interpolate the tracking position.

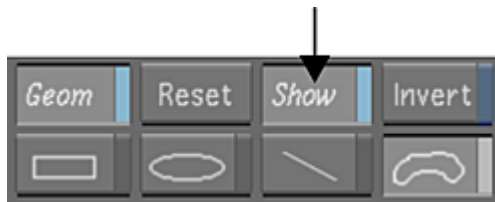
Assigning and Unassigning Point Trackers to Geometries

geometries:assigning tracking data tracking:geometries You can assign Point Trackers to, or unassign Point Trackers from, geometries at any time after you create them.

You can assign a Point Tracker to the axis of any geometry when you want to animate the entire geometry with or without changing its shape. You can also assign a Point Tracker to a vertex of a geometry when you want part of the edge of the geometry to change as it tracks a moving element in the shot. However, if you want to assign Point Trackers to all the vertices in a geometry, use Track Shape. See [Animating the Shape of Geometries with the Point Tracker](#) (page 509).

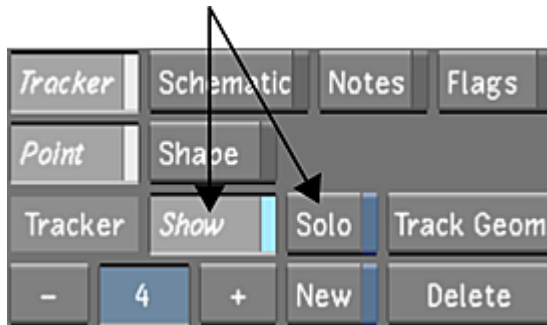
To assign a Point Tracker to a geometry:

- 1 In the Secondaries menu, activate the secondary layer button that contains the geometry you want to track.
- 2 Enable Show.



The geometry is displayed in the Player.

- 3 Do one of the following:
 - Add a new Point Tracker.
 - Click the + or - button to select a Point Tracker from the Tracker list. Make sure the tracker is set to On and is in Solo mode.



The current Point Tracker is displayed in the Player.

- 4 Enable Assign.



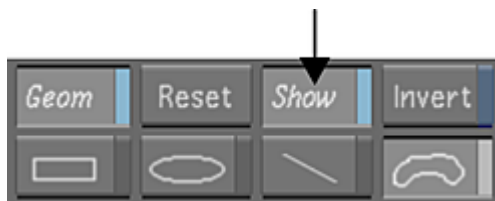
- 5 In the Player, do one of the following:
 - To animate the entire geometry without changing its shape, click the geometry's axis.
 - To animate a single vertex in a geometry, click the vertex.

The Point Tracker is assigned to the geometry's axis or vertex.

NOTE You cannot assign a Point Tracker to more than one point on a geometry. If the tracker is already assigned to a vertex or axis on the geometry, you must unassign it.

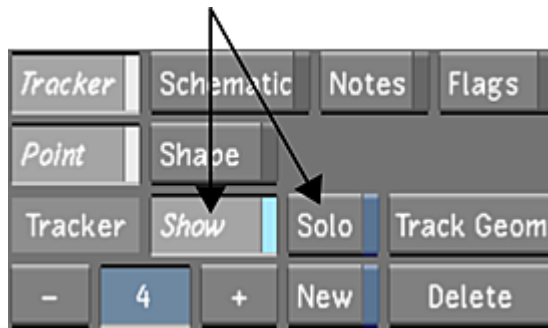
To unassign a Point Tracker from a geometry:

- 1 Select the shot that contains the tracking data.
- 2 In the Secondaries menu, enable Show.



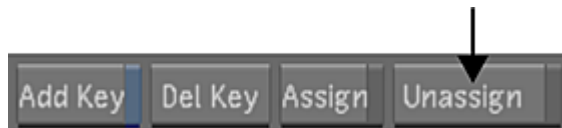
The geometry is displayed in the Player.

- 3 Click the + or - button to select a Point Tracker from the Tracker list. Make sure the tracker is set to On and is in Solo mode.



The current tracker is displayed in the Player.

- 4 Enable Unassign and then click the vertex or axis to which you assigned the tracker.



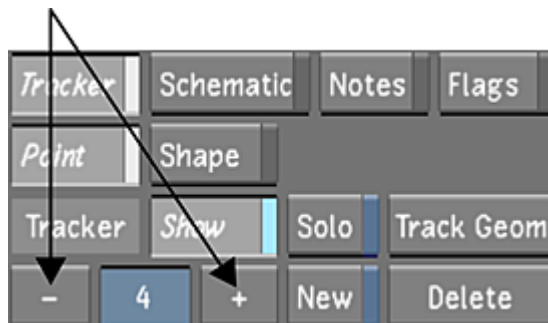
The Point Tracker is unassigned to the vertex but remains in the Tracker list.

Soloing and Ganging Point Trackers

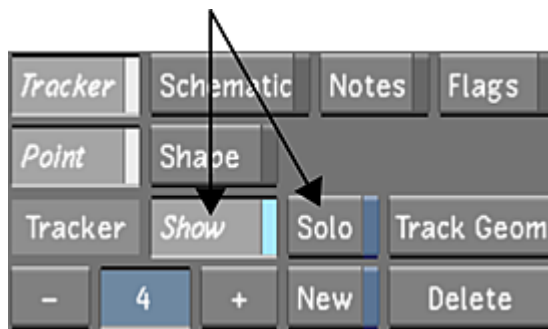
geometries:soloing and ganging point trackerpoint tracker:soloing and gangingYou can solo or gang Point Trackers. Solo a Point Tracker when you want to view and generate tracking data for the current tracker only. Gang Point Trackers when you want to view and generate tracking data for multiple Point Trackers at the same time.

To solo a Point Tracker:

- 1 Click the + or - button to select a Point Tracker from the Tracker list.



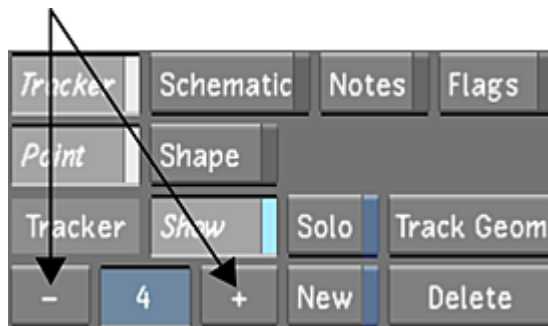
- 2 Make sure the Point Tracker is set to On and is in Solo mode.



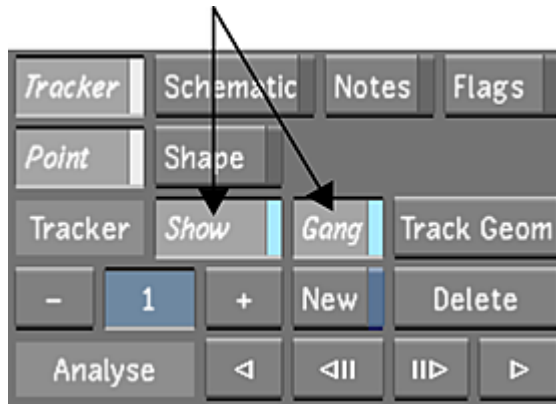
Only the current Point Tracker is displayed in the Player.

To gang Point Trackers:

- 1 Click the + or - button to select a Point Tracker from the Tracker list.



- 2 Make sure the tracker is set to On and is in Gang mode.



- 3 Repeat steps 1 and 2 for all the Point Trackers you want to add to the gang.
The ganged trackers that are set to On are displayed in the Player and can be analysed as a group.

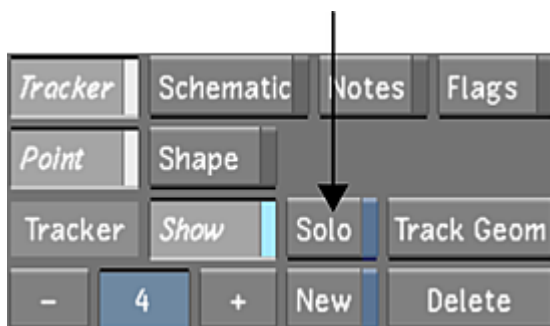
Deleting Point Trackers

geometries:deleting point tracker data frompoint tracker:deletingYou can delete Point Trackers from a shot.

To delete a Point Tracker:

- 1 Select the shot that contains the tracking data.

- 2 In the Secondaries menu, select Solo mode.



When you use Solo mode, only the current Point Tracker is displayed in the Player. If the tracker does not appear, set the tracker to On.

- 3 Click the + or - button to scroll to the Point Tracker you want to delete.



If the current Point Tracker is on, it is displayed in the Player.

- 4 Click Delete.



The Point Tracker is deleted.

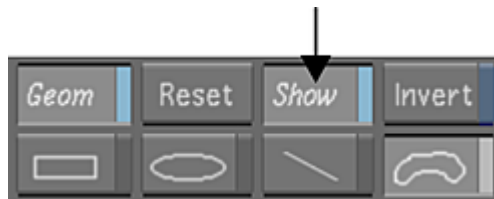
Loading Tracker and Stabilizer Data from Autodesk Applications

secondary colour grading:loading tracker and stabilizer dataYou can load tracker and stabilizer data created with other Autodesk products (Flint®, Flame®, Inferno®, Fire®, Smoke®, and Autodesk Combustion®) into Lustre. To import tracker and stabilizer data, you must export it from the applicable Autodesk product as a raw setup file, and then save it in the `C:\Program Files\Autodesk\<version number>\settings\geompresets` folder (Windows), or in the `/usr/autodesk/<version number>/settings/geompresets` directory (Linux).

NOTE You must create the *geompresets* directory manually to store your raw setup files. However, if you have created a preset, the *geompresets* directory is automatically generated.

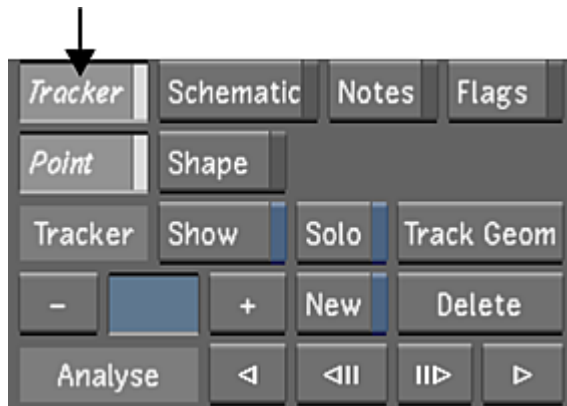
To load tracker or stabilizer data:

- 1 Save a tracker or stabilizer raw setup file from the applicable Autodesk product.
- 2 Do one of the following:
 - If using the Windows version of Lustre, store the raw setup file in the *C:\Program Files\Autodesk\<version number>\settings\geompresets* folder.
 - If using the Linux version of Lustre, store the raw setup file in the */usr/autodesk/<version number>/settings/geompresets* directory.
- 3 In the Secondaries menu, enable the secondary layer button that contains the geometry you want to track.
- 4 Enable Show.

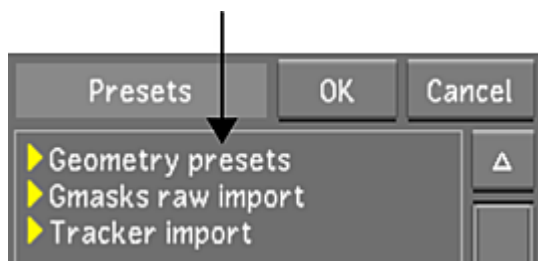


The geometries are displayed in the Player.

- 5 Click Tracker.



- 6 Click Point.
- 7 Click Presets to display the Presets list.



- 8 Expand Tracker import, and then select the tracker or stabilizer file.
- 9 Click OK.

The tracker appears in the Player and can be assigned to the points or axes of geometries.

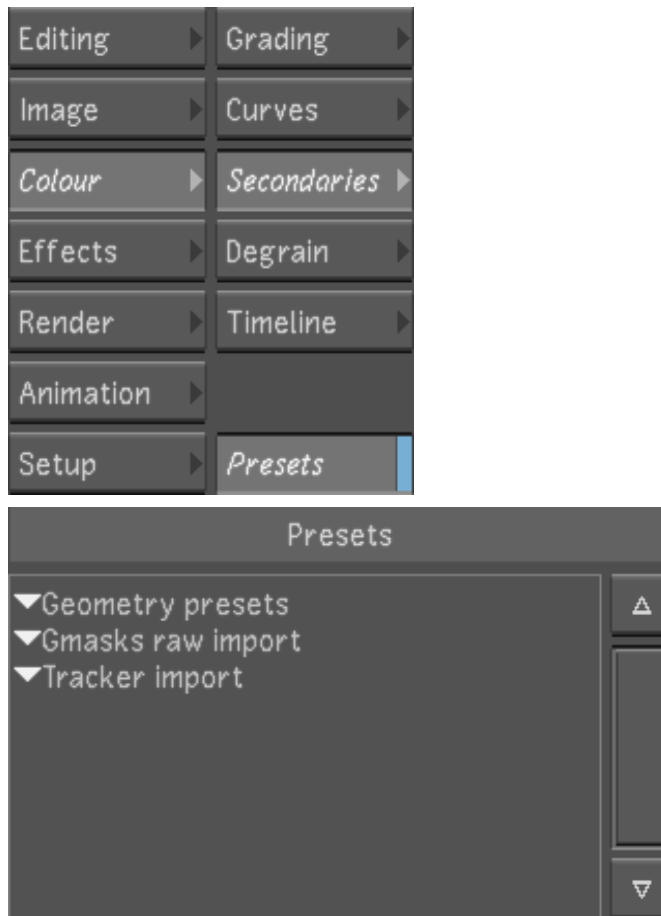
Loading Garbage Mask Setups from Autodesk Applications

secondary colour grading:loading garbage mask setupsgarbage masks, loading setupsYou can load garbage mask setups created with other Autodesk products (Flame, Flame Assist, Flare) to use as geometries in Lustre. To import a garbage mask setup, you must export it from the applicable Autodesk product as a raw setup file, and then save it to the Lustre program directory. You can then load the garbage mask setup to the current secondary for use as a geometry.

NOTE You must create the *geompresets* directory manually to store your raw setup files. However, if you have created a preset, the *geompresets* directory is automatically generated.

To load a garbage mask setup:

- 1 Export a raw setup file from the applicable Autodesk product.
- 2 Store the raw setup file in the `/usr/autodesk/<version number>/presets/geompresets` directory.
- 3 From the Colour / Secondaries menu, click the Presets button to display the Presets list.



- 4 Expand Gmasks raw import, and then select the raw setup file.
 - 5 Click OK to load the garbage mask setup.
- The geometry appears in the Player.

Mastering High Dynamic Range Content Using Dolby Vision

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Lustre is Dolby Vision Enabled and exposes additional UI elements when a suitable Dolby Content Mapping Unit connected to your Lustre system is detected. You should contact Dolby directly for information on how to obtain a Content Mapping Unit for use with Lustre.

Lustre allows you to perform Trim Passes on top of your High Dynamic Range master reference in order to adapt the HDR graded version to lower dynamic range display devices and help preserve colour intent for a variety of deliverables.

This topic covers system and setup requirements for this feature and describes the workflow.

System Requirements

You need a correctly configured workstation running Flame Premium or Lustre and the following:

- An AJA Kona 3G or AJA Kona 4 video IO board.
- An available Ethernet port.

You also need a suitable Content Mapping Unit hardware device from Dolby in order to activate the user interface used to produce HDR grades from Lustre. Please contact Dolby directly for information on how to obtain the required hardware.

Setting Up Lustre for generating Dolby Vision metadata

First, connect the Content Mapping Unit hardware to your Lustre workstation. Refer to the Dolby documentation for specific instructions regarding the configuration of the Content Mapping Unit in particular networking configuration.

Second, connect the AJA video outputs to the Content Mapping Unit video inputs and make sure the Lustre system and the Content Mapping Unit can 'ping' each other over the network.

Last, configure the video output to use an RGB 4:4:4 12 bits raster in order to access the additional user interface and perform HDR mastering work. See [Selecting a Raster for Playout](#) (page 662). You can also save the selected raster as a project preference.

Typically, you will have an HDR reference "mastering" display being fed directly with your HDR graded images and one or more lower quality "target" displays for which you are generating the Dolby Vision metadata that are fed via the Content Mapping Unit.

NOTE You can only send an HD or 2K SDI signal to the Content Mapping Unit.

Additional User Interface Elements for using Dolby Vision

When a 12 bits video raster is enabled and a Content Mapping Unit is detected by Lustre, new buttons appear in the Lustre interface.

- In the view selector section, the D button changes to an H.



NOTE HDR mastering using Dolby Vision is only possible while the H view is selected.

- In the Colour menu, the DCM button appears. It allows you to access the Trim pass controls.



NOTE Lustre tries to detect a Content Mapping Unit for up to 5 seconds after a suitable 12 bits raster is selected, consequently the additional UI may not be available immediately after starting Lustre.

Dolby Vision HDR Metadata Workflow

Dolby Vision mastering is the process by which a High Dynamic Range graded reference is optimized, or trimmed, to make the best use of the capacities of a lower dynamic range display. In Lustre, Dolby Vision mastering is performed in real-time using the available Dolby Vision controls. The generated metadata is streamed instantly to the connected Content Mapping Unit and the results can be viewed immediately on the target display. The resulting metadata from the Dolby Vision mastering can then be exported in an XML format to accompany the original HDR reference media.

Note that before you begin the Dolby Vision mastering process you need to have a finished HDR timeline that has been graded for your HDR reference display. The Dolby Vision mastering process simply creates metadata to accompany these image files, the image files are not changed.

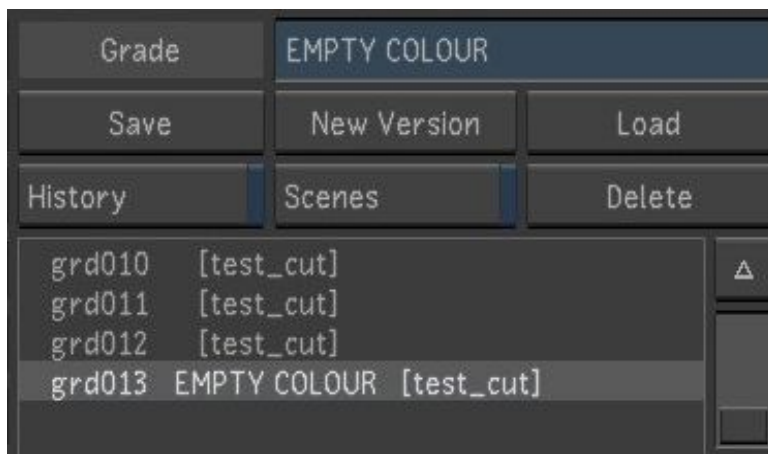
Steps required for Dolby Vision mastering:

- 1 Create a new Colour grade version.
This colour grade should be empty and is only used to link the HDR grade to Lustre's metadata files.
- 2 Create an HDR setup.
- 3 Perform HDR mastering.
- 4 Save the HDR setup.

Creating an HDR Setup

The Dolby Vision metadata is saved in a separate file that is distinct from the grade file. It is saved alongside the colour grade file in the Lustre project Library folder. Follow these steps to create an initial setup file for your work.

- 1 In the Main menu, click Setup and then click Grade. The Grade menu appears
- 2 From the Grade list, load the grade that you wish to associate with an HDR setup.



NOTE Although grading controls are disabled when performing HDR mastering it is recommended that you use a dedicated colour grade setup for HDR mastering work

- 3 Click 'H'



- 4 Select the media origin to be used during the trim pass work. Click Enable Source if you are starting with a new reference timeline that does not have any Lustre grading done. Note that in this mode you should not use any of the normal Lustre grading controls since this would cause your Dolby metadata to no longer correspond to your reference files. Enable Rendered if you are generating Dolby Vision metadata in the same project for which you have just generated your HDR reference grade using the Lustre grading controls (in other words, P view represents your reference HDR grade). Note that in this mode if you make any changes to your Lustre reference grade you will need to rerender, redo the Dolby analysis, and then readjust your Dolby trim values for the modified shots.



NOTE The grading controls are disabled in 'H' view

- 5 In the HDR field enter an HDR setup name.
- 6 Click New. The setup name is added to the list of setups for the grade.

You are ready to start the Trim Pass work.

Performing Dolby Vision mastering

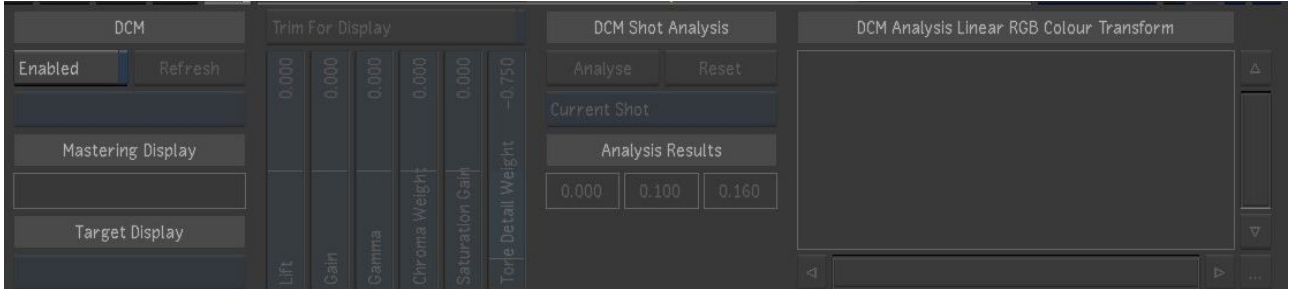
Once the HDR setup file is created you are ready to start HDR mastering work. In this section, learn how to:

- 1 Access the Dolby Vision controls and select a Target display
- 2 Perform initial colour analysis

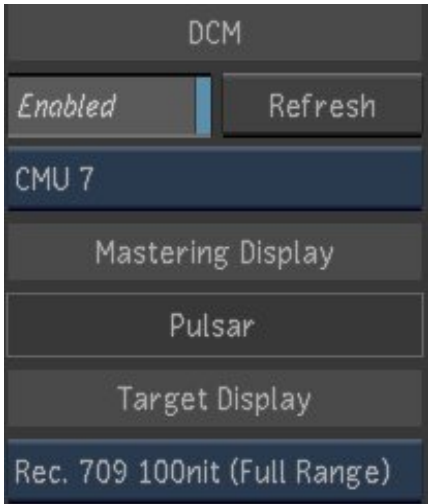
- 3 Perform additional Trim work.

Accessing the Dolby Vision controls

- 1 In the Main menu, click Colour, and then click DCM. The HDR menu appears.
- 2 Initially the entire user interface is greyed out, until you click Enabled.



- 3 Click Enabled to instruct Lustre to fetch the Mastering Display and Target Display characterizations from the Content Mapping Unit. This populates the corresponding drop down lists from the data transmitted by the Content Mapping Unit.



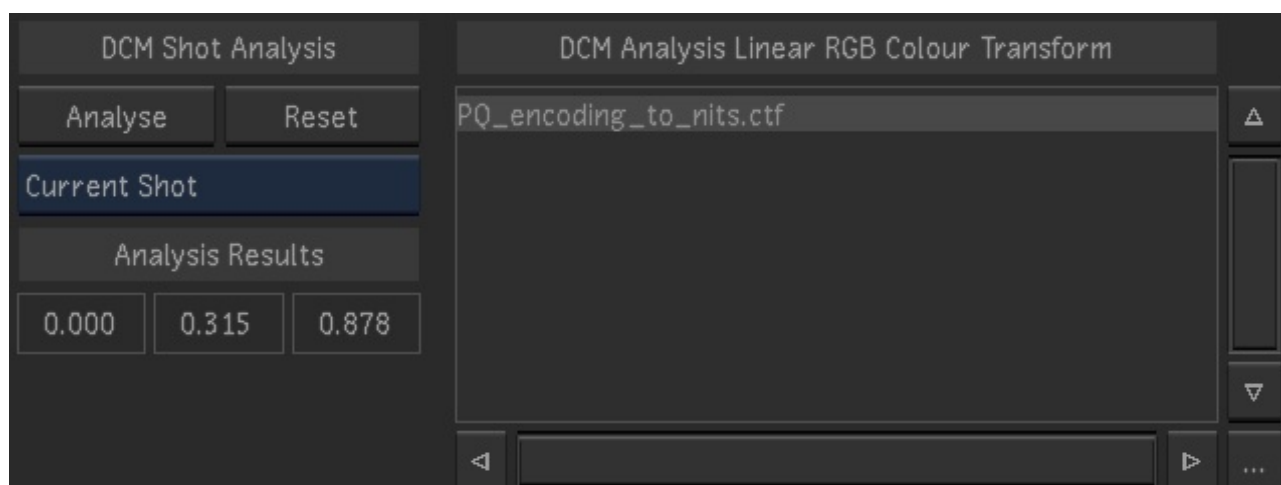
NOTE The Content Mapping Unit only knows about a pre-determined set of Mastering and Target displays. Select the ones that correspond to your displays. Please consult appropriate vendor documentation for details on display characterization.

- 4 If more than one Content Mapping Units are detected, the CMU drop-down lists only the first one that was detected.

Performing initial colour analysis

The HDR reference master must first be analyzed to produce base level metadata. The base level metadata is shot based and every shot in the timeline can have a different set of base level metadata.

- 1 Select a colour transform to bring the HDR master to linear colour space for analysis.



NOTE The choice of colour transform depends on the colour space of your HDR reference master. The most common scenario is for the HDR reference master to be encoded for a display calibrated to SMPTE ST-2084 (also known as PQ) and with P3 primaries and to have the Dolby Pulsar to be selected as the Mastering Display. The `PQ_encoding_to_nits.ctf` in the Autodesk colour transform collection (gamma directory) is the appropriate transform to select in this case (it simply converts the PQ values to nits without changing the primaries). Advanced users may need a different transform and this can often be built by going into Render/Output, assembling a Custom colour transform that does the appropriate conversion, and exporting it for use in this menu. The transform you use needs to convert the colour space of your HDR reference master into linearized radiance values in units of candelas per square meter (nits) and in the primaries of the HDR Mastering Display that is selected in the Content Mapping Unit.

- 2 From the drop down list, select whether to perform the analysis on the current shot, set of selected shots or the whole timeline
- 3 Click Analyse, the analysis starts and the images are analyzed one by one to produce the base level metadata.

NOTE Letterboxing will throw off the analysis results. Use the controls in Render/Resize to crop the image to remove any letterboxing. At this time we recommend cropping the image so that no black bars are sent to the Content Mapping Unit.

Performing additional Trim passes

It may be necessary to further adjust the look for certain shots. Once the analysis has been performed for a shot, the Trim controls become available to help refine the shot's look

- 1 Click Trim for Display, for the trim controls sliders to become available



- 2 Adjust the controls to obtain the desired look for the shot.
- 3 The Trim controls can be animated for any shot using standard animation controls.

NOTE When in H mode, only the HDR mastering controls are visible in the Animation panel.

Saving and Loading an HDR setup

From time to time it is necessary to save your work. You can choose to create a new version of your work by entering a new name in the HDR setup field and by clicking New. You can also overwrite the current setup by clicking on the Save button. The current HDR setup is also saved when you save the current colour grade.

NOTE The save operation is not undoable.

You can load a previously created HDR setup to review previous work or to continue work on a project.

To load an existing HDR setup

- 1 Enter the H mode by clicking the H button in the view selector.
- 2 Select the HDR setup you wish to load.
- 3 Click Load.

The selected HDR setup is loaded along with the associated colour grade.

Creating Lustre Sparks Effects

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<\$nopage>plugins.<italic> See <Default Para Font>SparksSparks:overviewYou can apply effects to your shots using Lustre Sparks plugins created by Autodesk or third-party developers. These plugins are image processing effects that you can add to individual shots. You can apply up to six effects to the same shot.

Lustre Sparks plugins occupy a specific, fixed spot in the processing pipeline in Lustre— between the secondary and output colour grading. You can therefore create them anytime and the effect will be the same. It is suggested to add them after the secondary grading process so that you can see the effect on the graded shot.

Lustre Sparks plugins are integrated into the application and function in the same way as any effect in Lustre. For example, as with colour grading effects, you can apply a plugin created on one shot to another shot. When you save the grade, plugin data is saved with colour grading data in the grade file. Likewise, Lustre Sparks plugins are rendered with all other effects in the processing pipeline and are reset in the same way as other effects.

Installing Lustre Sparks Plugins

installing, SparksSparks:installing Lustre Sparks plugins are installed automatically during Lustre installation. They are included with all Lustre configurations, as well as with all render components, including the Linux render farm package for background rendering.

NOTE You can modify plugin parameters on the Master Station or the Lustre HD Station. On the Lustre Station, you can only view the plugins.

All Lustre Sparks plugins reside in the plugins directory. If developing your own plugins, you must place them in the plugins directory and they must have a *.dll extension. If running the Windows version of Lustre, save your plugins in the *C:\Program Files\Autodesk\<version number>\plugins* folder. If running the Linux version of Lustre, save your plugins in the */usr/autodesk/<version number>/plugins* directory.

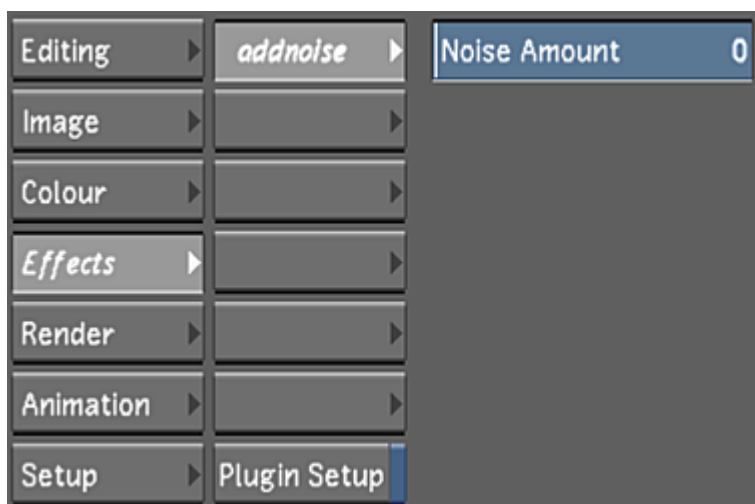
Removing a Lustre Sparks plugin consists of deleting it from the plugins directory.

For details on developing Lustre Sparks plugins, see [Developing Lustre Sparks Plugins](#) (page 540).

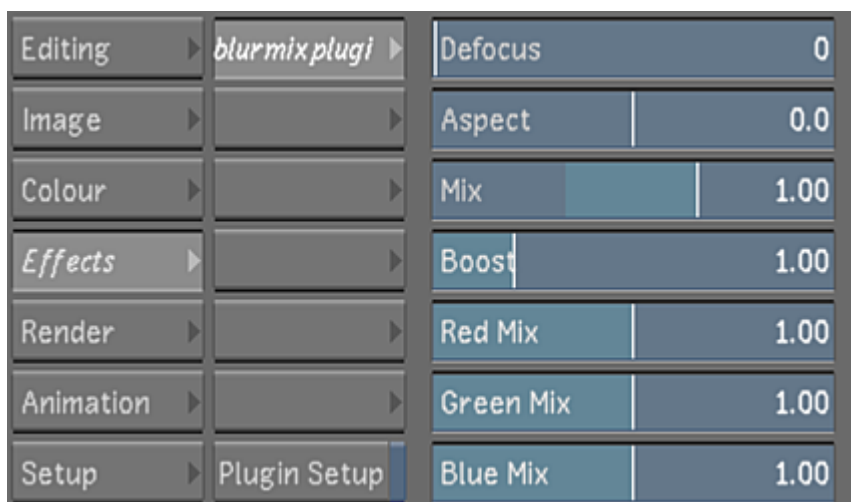
Lustre Sparks Plugin Descriptions

Sparks:descriptionsThere are several Lustre Sparks plugins that are included with Lustre. These plugins, and their parameters, are described in the following sections.

Add Noise noise, adding with SparksSparks:using to add noiseGrain-type plugin that you can use for adding random noise to an image. Use the Noise Amount parameter to adjust the amount of noise added to the shot.



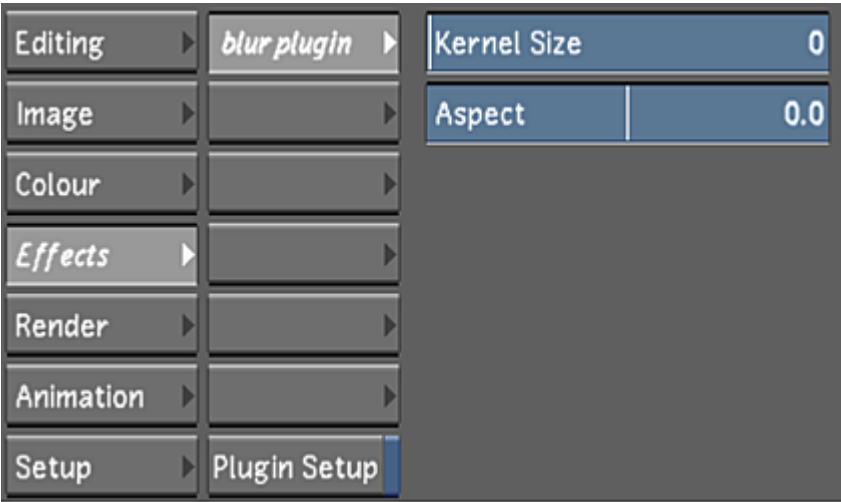
Blur Mix blurring:with SparksSparks:using to blur imagesBlur-type plugin that performs a multiply mix between the original image with the blurred image. You can also use this plugin to sharpen or tint an image.



Use:	To:
Defocus	Set the amount of blur.
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.
Mix	Adjust the amount of mix between the original image and the unblurred image. By default, this value is set to 1. If you set the value to zero, no mix occurs and you see only the original image. Setting the mix to a negative value sharpens the image.
Boost	Multiply key values when using the plugin on a secondary key. This allows you to visually grow your key by increasing the range of the key value.
Red Mix	Adjust the red gain of the blurred image.

Use:	To:
Green Mix	Adjust the green gain of the blurred image.
Blue Mix	Adjust the blue gain of the blurred image.

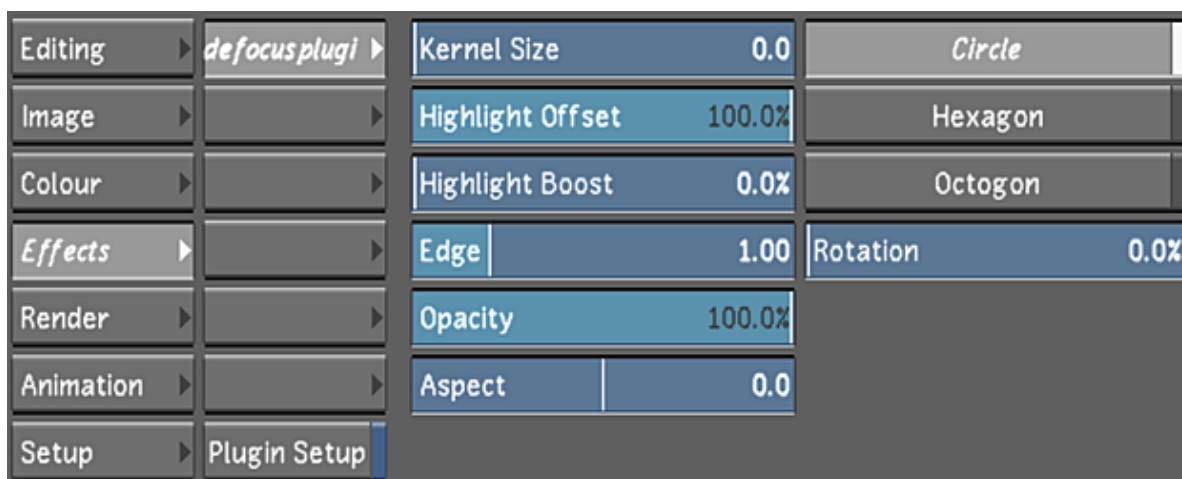
Blur Simple blur plugin using a high-speed algorithm.



Use:	To:
Kernel Size	Adjust the amount of blur.
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.

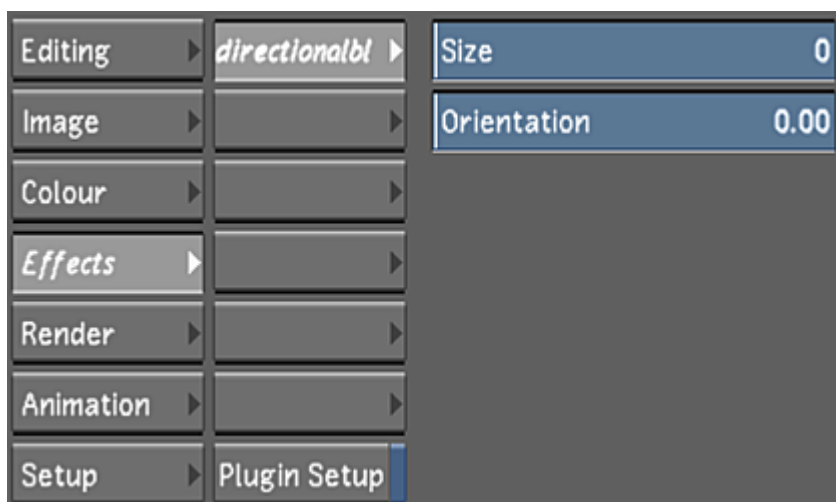
Colour Transform colour transform, adding with SparksSparks:using to apply colour transformPlug-in to apply a colour transform to a shot in-between the Secondaries and Output Primaries. Use the Browse button to load any supported type of colour transform (CTF, CDL, 3D-LUT, etc.). The transform path for each shot is stored in the XML grade file which opens up possibilities to tie this into an automated workflow. This plug-in is only supported in GPU mode. Please ensure that the path to the LUT or CTF is visible to any remote render nodes. If the file is not available, rendering will proceed but without the plug-in.

Defocus Blur-type plugin that simulates a camera out-of-focus effect. Along with the blur parameters, this plugin includes variable iris types, additional highlight controls, as well as a control for softening the edge of a secondary.



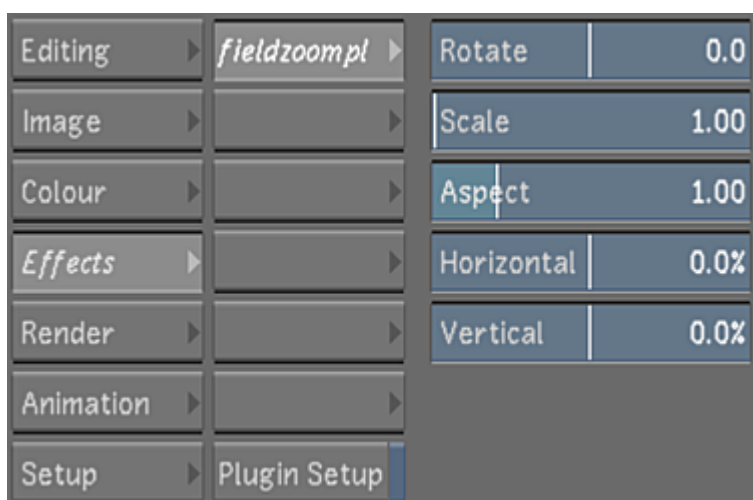
Use:	To:
Kernel Size	Set the amount of the camera defocus.
Highlight Offset	Offset the highlight range.
Highlight Boost	Increase the highlight range.
Edge	Adjust the edge softness of a matte when using this plugin with a secondary.
Opacity	Change the opacity of the image. By adding transparency, you see through to the original image.
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.
Circle, Hexagon, Octagon	Specify the shape of the plugin matrix (or camera iris) used to calculate how the defocus is applied.
Rotation	Rotate the plugin matrix (or iris).

Directional Blur Simple directional blur along a specified direction.



Use:	To:
Size	Adjust the amount of blur.
Orientation	Change the direction of the blur.

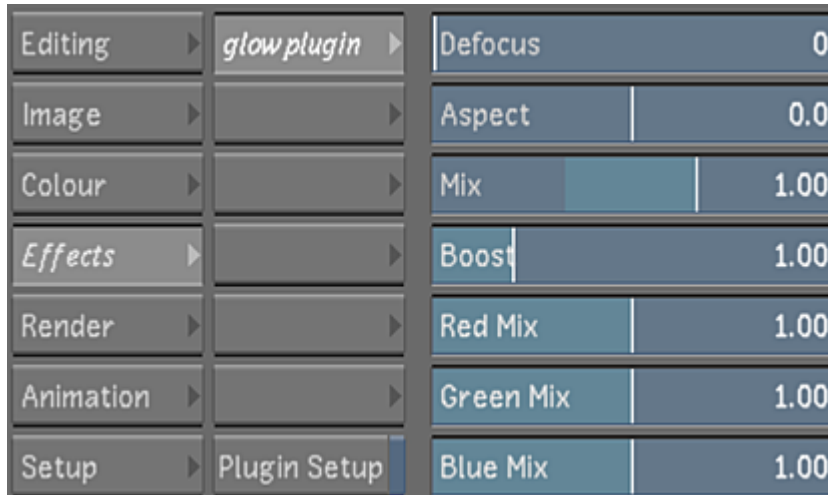
Field Zoom repositioning:interlaced footage using SparksSparks:using to reposition interlaced footagePan, scan, scale, and rotate interlaced footage. The parameters in this plugin work in the same way as the tools in the Image > Reposition menu, except that they are applied to individual fields instead of the entire frame. This yields a smooth image from interlaced footage even after repositioning.



Use:	To:
Rotate	Rotate the fields.
Scale	Resize the fields.
Aspect	Adjust the aspect ratio of the fields.

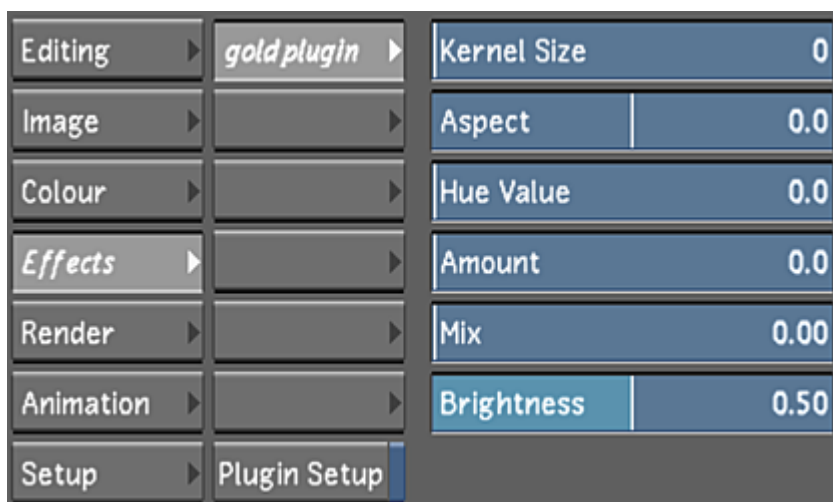
Use:	To:
Horizontal	Adjust the horizontal position of the fields.
Vertical	Adjust the vertical position of the fields.

Glow blurring:with SparksSparks:using to blur imagesBlur-type plugin that can be used by itself or combined with a secondary key.



Use:	To:
Defocus	Adjust the amount of blur.
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.
Mix	Adjust the amount of mix between the original image and the blurred image.
Boost	Multiply key values when using the plugin on a secondary key. This allows you to visually grow your key by increasing the range of the key value.
Red Mix	Adjust the red gain of the blurred image.
Green Mix	Adjust the green gain of the blurred image.
Blue Mix	Adjust the blue gain of the blurred image.

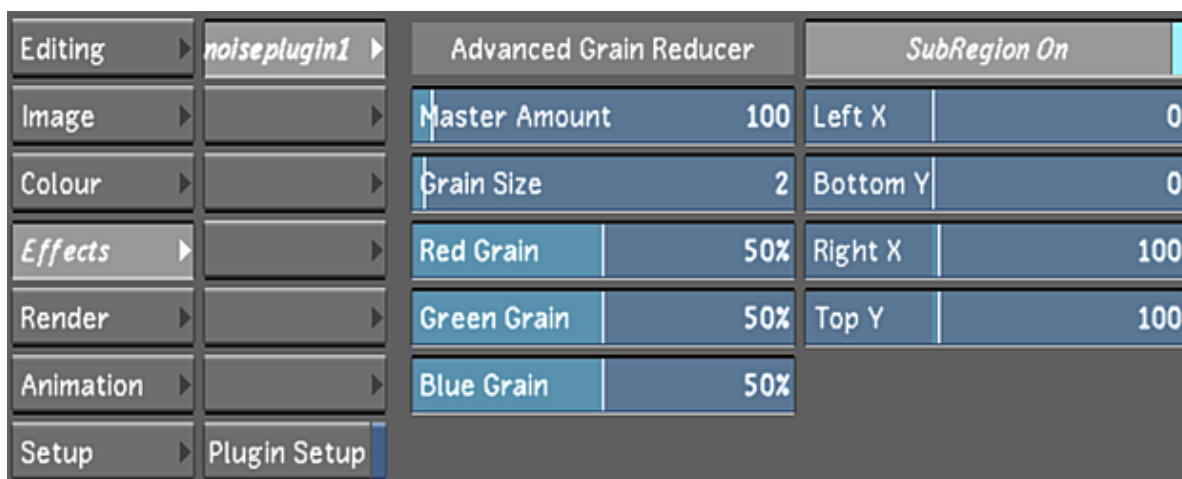
Gold Blur-type effect that allows you to soften and tint an image. The defocused and coloured image is multiplicatively combined with the original image to create a coloured soft-filter look.



Use:	To:
Kernel Size	Adjust the amount of blur.
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.
Hue Value	Set the hue that is used to tint the image.
Amount	Adjust the amount of the selected hue.
Mix	Adjust the amount of mix between the original image and the blurred, tinted image. The other parameters have no effect until you set the Mix value.
Brightness	Adjust the brightness of the tinted image.

Noise Plugin 1 This grain-type plugin is a first generation advanced noise reducer that uses a spatial filter with detail preservation control. It is useful for grain, noise, or detail reduction. During playback, this plugin updates dynamically as you adjust the values, so you can see how the grain removal works in context of the shot.

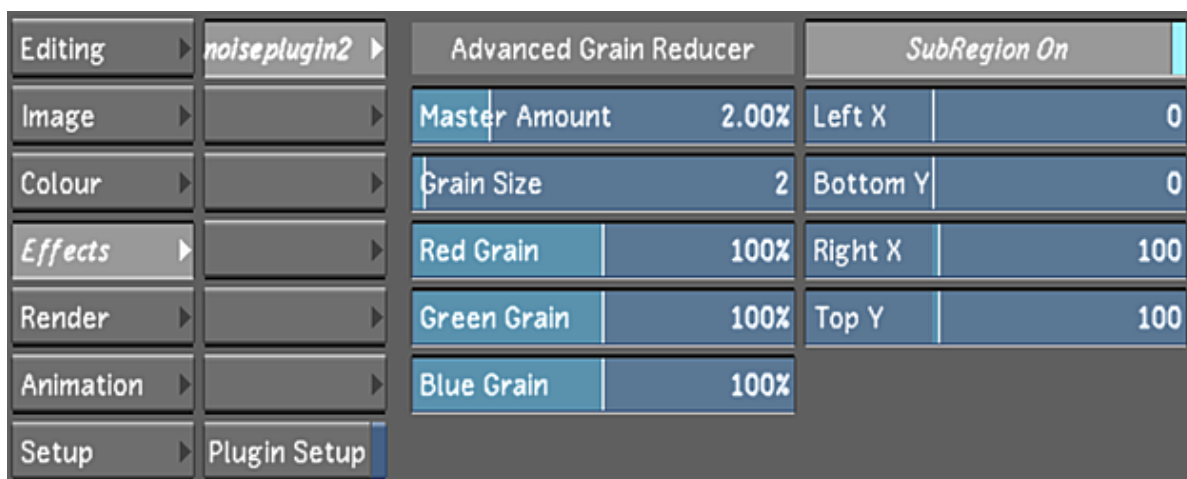
If the plugin processing slows down image playback, you can restrict grain reduction to a subregion of the frame.



Use:	To:
Master Amount	Set how much the grain is reduced. The default value (or less) generally produces a good result for grain removal.
Grain Size	Set the size of grain that is reduced.
Red Grain	Independently adjust grain removal on the red colour channel.
Green Grain	Independently adjust grain removal on the green colour channel.
Blue Grain	Independently adjust grain removal on the blue colour channel.
SubRegion On	Restrict the grain setting to the subregion defined by the bounding box. Right-click in the subregion to drag it to another position. Adjust the size of the subregion by clicking and dragging a corner of the subregion bounding box.
Left X, Bottom Y, Right X, Top Y	You can adjust the size of the subregion bounding box by adjusting these parameters.

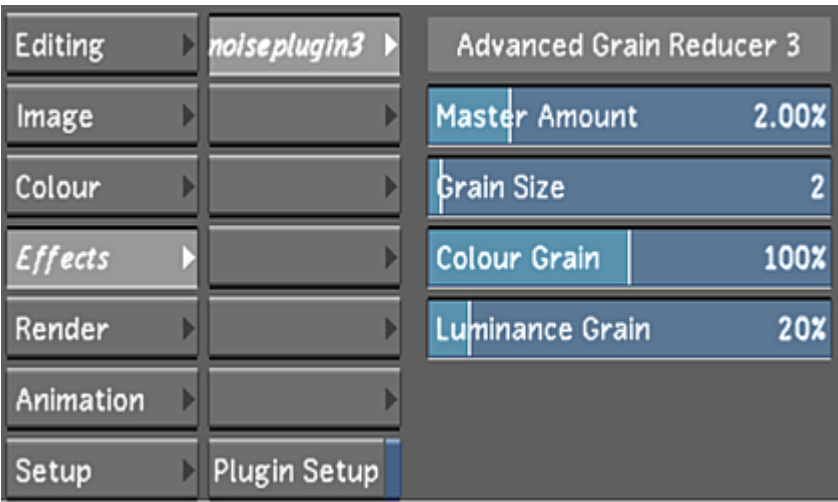
Noise Plugin 2 This grain-type plugin is a second generation advanced noise reducer that uses a spatial filter with detail preservation control. It is useful for grain, noise, or detail reduction. During playback, this plugin updates dynamically as you adjust the values, so you can see how the grain removal works in context of the shot.

If the plugin processing slows down image playback, you can restrict grain reduction to a subregion of the frame.



Use:	To:
Master Amount	Set how much the grain is reduced. The default value (or less) generally produces a good result for grain removal.
Grain Size	Set the size of grain that is reduced.
Red Grain	Independently adjust grain removal on the red colour channel.
Green Grain	Independently adjust grain removal on the green colour channel.
Blue Grain	Independently adjust grain removal on the blue colour channel.
SubRegion On	Restrict the grain setting to the subregion defined by the bounding box. Right-click in the subregion to drag it to another position. Adjust the size of the subregion by clicking and dragging a corner of the subregion bounding box.
Left X, Bottom Y, Right X, Top Y	You can adjust the size of the subregion bounding box by adjusting these parameters.

Noise Plugin 3 This grain-type plugin is a third generation advanced noise reducer that uses a spatial filter with detail preservation control. You can control luminance and colour noise processing separately.



Use:	To:
Master Amount	Set how much the grain is reduced. The default value (or less) generally produces a good result for grain removal.
Grain Size	Set the size of grain that is reduced.
Colour Grain	Adjust grain reduction on colour grain only.
Luminance Grain	Adjust grain reduction on luminance grain only.

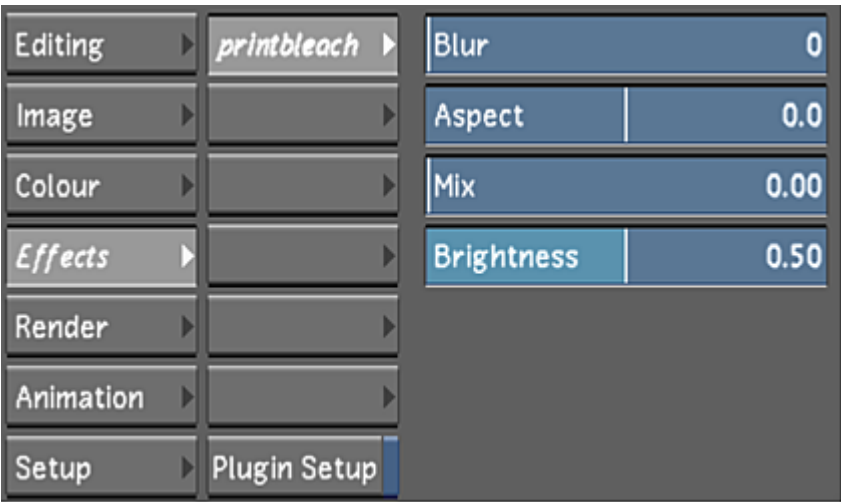
Noise Plugin 3.1 noise, adding with SparksSparks:using to add noiseThis grain-type plugin is a third generation advanced noise reducer that uses a spatial filter with detail preservation control. It is useful for colour noise processing, and allows you to specify whether processing should occur in the shadows, midtones, or highlights. During playback, this plugin updates dynamically as you adjust the values, so you can see how the grain removal works in context of the shot. It is the fastest of the four noise plugins available in Lustre.

If the plugin processing slows down image playback, you can restrict grain reduction to a subregion of the frame.

Editing	▶	noiseplugin3	▶	Advanced Grain Reducer 3	SubRegion On
Image	▶		▶	Master Amount 2.00%	Left X 0
Colour	▶		▶	Grain Size 2	Bottom Y 0
Effects	▶		▶	Colour Grain 100%	Right X 100
Render	▶		▶	Shadow Grain 20%	Top Y 100
Animation	▶		▶	Midtone Grain 20%	
Setup	▶	Plugin Setup		Highlight Grain 20%	

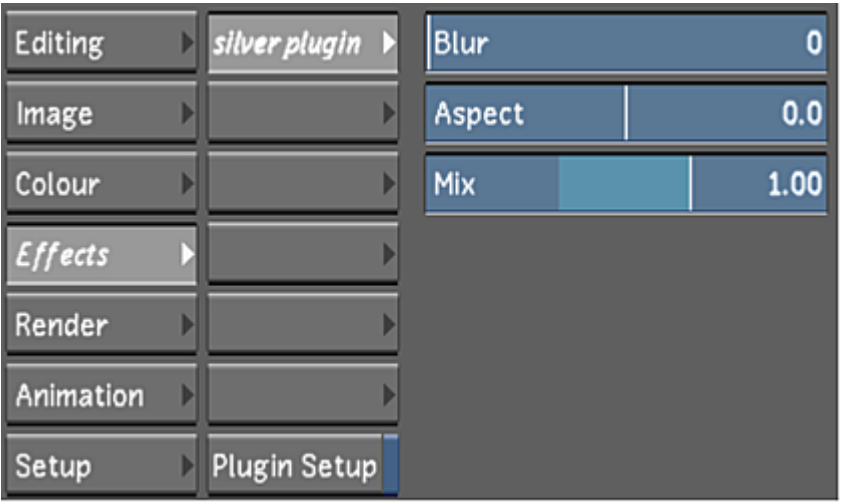
Use:	To:
Master Amount	Set how much the grain is reduced. The default value (or less) generally produces a good result for grain removal.
Grain Size	Set the size of grain that is reduced.
Colour Grain	Adjust grain reduction on colour grain only.
Shadow Grain	Adjust grain reduction in the shadows only.
Midtone Grain	Adjust grain reduction in the midtones only.
Highlight Grain	Adjust grain reduction in the highlights only.
SubRegion On	Restrict the grain setting to the subregion defined by the bounding box. Right-click in the subregion to drag it to another position. Adjust the size of the subregion by clicking and dragging a corner of the subregion bounding box.
Left X, Bottom Y, Right X, Top Y	You can adjust the size of the subregion bounding box by adjusting these parameters.

Print Bleach blurring:with SparksSparks:using to blur imagesBlur-type plugin that creates an effect similar to the chemical print bleach process. This plugin increases contrast for the shadows while desaturating the image. When you use this plugin, you first set a mix value so that you mix the image onto itself, and then you blur and brighten the underlying layer.



Use:	To:
Blur	Adjust the amount of blur. The blur parameter has no effect until you set the mix parameter.
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.
Mix	Change the amount of the mix. By increasing the mix value, you increase the contrast and decrease the saturation of the image.
Brightness	Adjust the amount of brightness of the blurred image. The brightness parameter has no effect until you set the mix parameter.

Silver Blur-type effect that mixes a black-and-white (desaturated) image with the original image creating a soft-filtered look.



Use:	To:
Blur	Adjust the amount of blur. The blur parameter has no effect until you set the mix parameter.

Use:	To:
Aspect	Adjust the orientation of the blur. A negative value produces a horizontal blur and a positive value produces a vertical blur.
Mix	Adjust how much the black and white image is mixed with the original. Use a negative value to give your image a silver look.

Creating an Effect with a Lustre Sparks Plugins

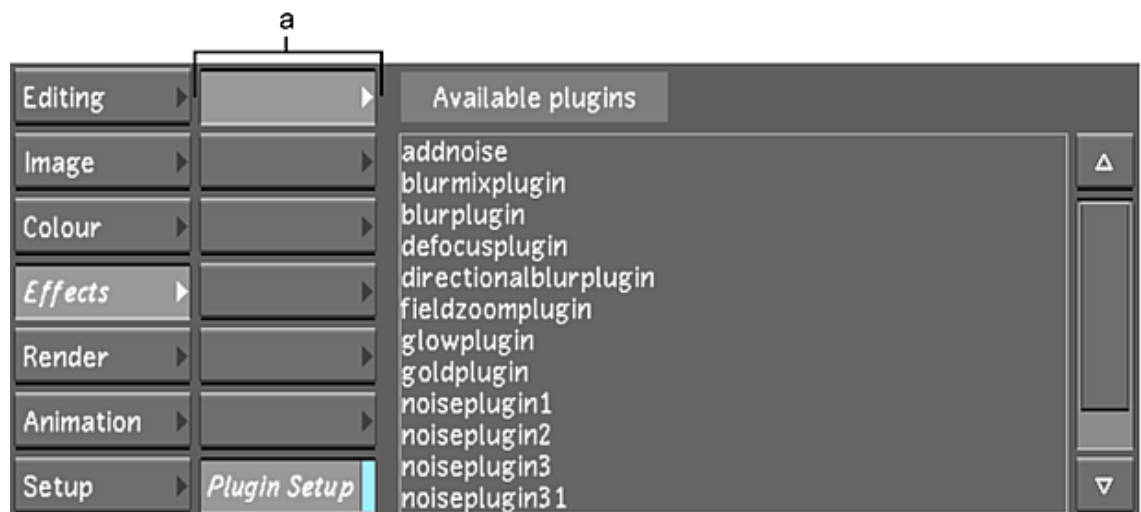
Sparks:creating effects witheffects, creating with SparksLoad and use Lustre Sparks plugins from the Effects menu. You can load up to six plugins at a time.

Each plugin has various parameters that you set to create the desired effect. Apply the effect to the whole shot, or an area of a shot defined by a secondary. You can animate the effect to make it change over time. You can also create an effect using a single or multiple plugins on the same shot. The order of the plugin in the menu will affect the final result, as they are processed sequentially starting with the plugin at the top of the menu and continuing down.

To load a plugin and create an effect:

- 1 In the Storyboard, select the shot to which you want to apply the effect.
- 2 From the Main menu, click Effects to display the Effects menu.
- 3 Enable Plugin Setup.

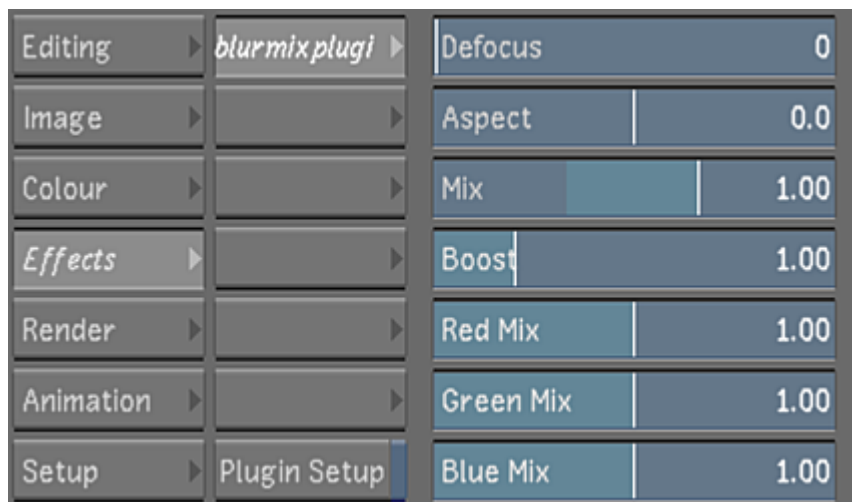
A list of the available plugins is displayed.



(a) Blank plugin buttons

- 4 Click the blank button in which to load the plugin.
- 5 Select a plugin from the Available plugins list.

The plugin is loaded and its name appears on the selected button. The plugin parameters appear to the right of the button.



TIP You can also replace a loaded plugin with another by loading the second plugin into the button used by the first. In this case, the settings of the replaced plugin are deleted.

- 6 Set the parameters as needed.

The parameters are applied to the entire shot and the image is dynamically updated to reflect the changes.

- 7 If you wish, modify the effect by repeating the previous steps on the shot with other plugins.secondary colour grading:applying SparksSparks:applying to secondaries

To apply an effect to an area defined by a secondary:

- 1 In the Storyboard, navigate to the shot you are applying the effect on.
- 2 Create one or more secondaries for the shot to which you want to add an effect.
- 3 In the Main menu, click Effects to display the Effects menu.
- 4 Select a blank plugin button and choose a plugin from the Available plugins list.
- 5 Select a secondary layer that corresponds to the secondary you want to use:
 - Right-click the Secondary slider to display the calculator and enter the number of the secondary layer.
 - Click and drag within the Secondary slider to select the secondary layer.

NOTE The Field Zoom plugin does not allow you to select a secondary layer.



- 6 Enable the Use Secondary Mask button.
The plugin is applied to the area defined in the secondary layer.
- 7 Set the parameters as needed.

To animate an effect:

- 1 Place the positioner on the frame where you want the effect to start.
- 2 Enable AutoK.
The AutoK button turns yellow.



- 3 In the Main menu, click Effects to display the Effects menu.
- 4 Make sure the plugin you want to animate is selected.
The plugin name on the button is highlighted and italicized and its parameters appear to the right of the buttons.



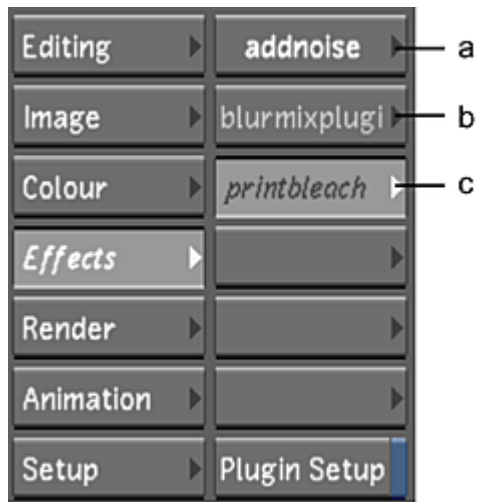
- 5 Set one or more of the parameters.
As soon as you change a parameter, a blue line in the Shot timebar appears indicating a keyframe.
- 6 Move the positioner to the next frame where you want to set another keyframe and adjust one or more of the parameters. Continue to add keyframes as needed.

Disabling and Re-enabling Lustre Sparks Plugins

disabling:SparksSparks:disabling and re-enablingYou can disable and re-enable loaded Lustre Sparks plugins. Disabling a plugin allows you to temporarily view the shot without the effect while retaining the settings.

To disable and re-enable a plugin:

- 1 Right-click the plugin button to toggle between disabling and re-enabling the plugin.
When the plugin is disabled, the text on the button is grey. When the plugin is enabled, the text on the button is white.



(a) Enabled plugin (b) Disabled plugin (c) Selected and disabled plugin

Developing Lustre Sparks Plugins

developing, SparksSparks:developingAn application programming interface (API) is available to third-party developers for creating Lustre Sparks. The API is provided on the Lustre CD. If you are interested in developing commercial Lustre Sparks, you must apply to the system Sparks program. To request an application, send an e-mail to sparks@luminate.com and indicate your interest in developing specifically for Lustre. For more information, see the *Plugin Reference Guide*.

animations:overviewIn Lustre, you create animations with the Channel Editor by making channel values change over time. When you set values for a channel, they are plotted on a curve in the Channel Editor. This curve maps frame numbers (time) on the horizontal axis and channel values on the vertical axis.

When you explicitly set a channel value at one frame, you are creating a keyframe. If you set more than one keyframe, the values between the keyframes are automatically calculated, creating an animation curve. This is called interpolation. You can customize the shape of the animation curve to control how quickly and by how much the parameters change.

By controlling interpolation and keyframes, you can create complex animations involving numerous variable parameters. For example, you can animate primary and secondary colour as well as Sparks effects (such as a blur). You can also make a dull stationary shot dynamic and therefore more visually interesting using frame positioning and scaling.

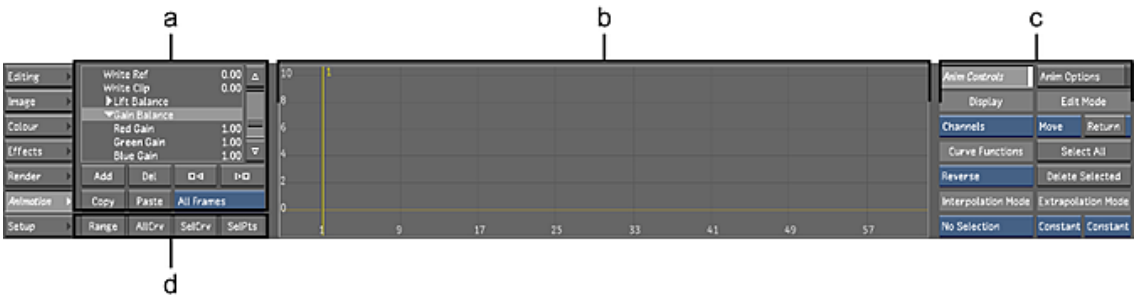
Once you create an animation, you can use the Track Editor to adjust animation timing or duration without changing the keyframe values.

Accessing the Channel Editor

Use the animation curves in the Channel Editor to create animations.

To access the Channel Editor:

- 1 In the Main menu, click Animation.
The Channel Editor appears.



(a) Channel hierarchy (b) Animation Curves window (c) Animation controls (d) Channel Display buttons

The Channel Editor is made up of the following elements.

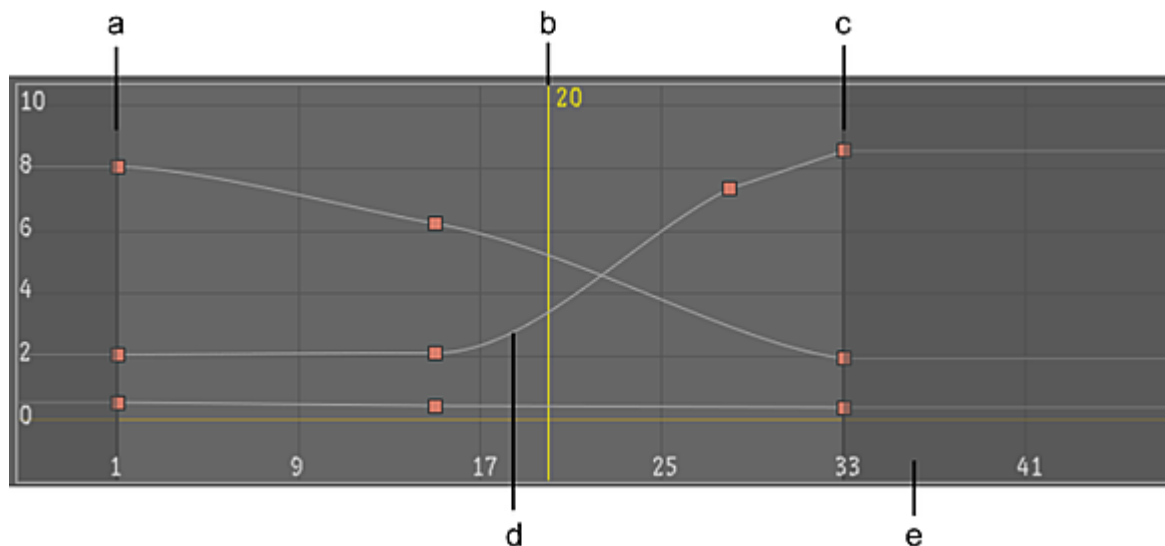
Channel hierarchy Use to select the folders and channels to animate. You can also refer to the Channel hierarchy to quickly see what channels contain keyframes.

Animation Curves window Use to create and view animation curves, adjust interpolation, and add, edit, or delete keyframes. The [Track Editor](#) (page 570), used to adjust animation timing, appears in place of the Animation Curves window when you select the Tracks option in the Display option box.

Animation Controls and Animation Options Use to switch between animation modes, select and view channels, and control interpolation.

Animation Curves Window

You perform most animation operations in the Animation Curves window.



(a) Start of current shot **(b)** Positioner **(c)** End of current shot **(d)** Animation curve **(e)** Trimmed frames

The Animation Curves window is made up of the following elements.

Current Frame positioner A vertical yellow line represents the current frame position.

Start and end of current shot Vertical thick grey lines represent the start and end of the current shot. If the shot is trimmed, the trimmed handles are greyed out.

Trimmed frames If you trimmed frames from the current shot, these frames are greyed out before or after the shot.

Animation curves Selected curves are white. Deselected curves are black.

Navigating in the Animation Curves Window

keyframes:navigating between keyframesUsing the Animation Curves window, you can go directly to any frame for the current shot, or you can go directly to previous or next keyframes. The Current Frame positioner always moves to reflect your new frame position in the current shot.

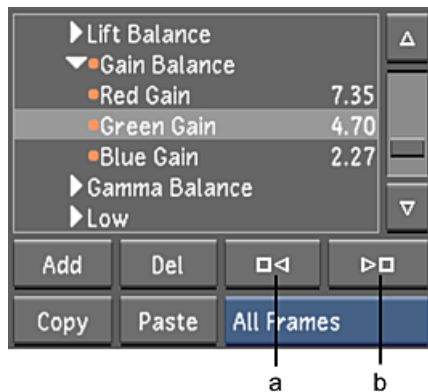
To move to any frame in the Animation Curves window:

- 1 Drag in the Shot timebar to scrub between frames in the current shot.
The Current Frame positioner moves in sync with the timebar positioners.

TIP You can also use the playback controls to navigate through the Animation Curves window.

To move between keyframes:

- 1 Do one of the following:
 - Click Next to move to the next keyframe.
 - Click Previous to move to the previous keyframe.



(a) Previous button (b) Next button

Displaying Curves in the Animation Curves Window

Use the buttons to the left of the Animation Curves window to change its display.

To view the entire channel range between keyframes in the Channel Editor:

- 1 Click Range.
All keyframes are loaded into the Animation Curves window.

To view all animated curves in the Channel Editor:

- 1 Click AllCrv.
All animated channels appear in the Animation Curves window.

To view the selected curve in the Channel Editor:

- 1 In the Channel hierarchy, select the animated channels.
- 2 Click SelCrv.
The selected curves are loaded into the Animation Curves window.

To view the selected keyframes in the Channel Editor:

- 1 In the Animation Curves window, select the keyframes. See [Selecting Keyframes](#) (page 555).
- 2 Click SelPts.
The animation curves are scaled so that the selected keyframes fill the Animation Curves window.

Panning and Zooming the Animation Curves Window

panning;animation curveszooming;animation curvesanimations:panning and zoomingYou can pan and zoom the Animation Curves window using the mouse. Do this when you need to see a part of the window that is not visible.

To pan the Animation Curves window:

- 1 Middle-click and drag to pan the Animation Curves window view horizontally or vertically.

To zoom the Animation Curves window view:

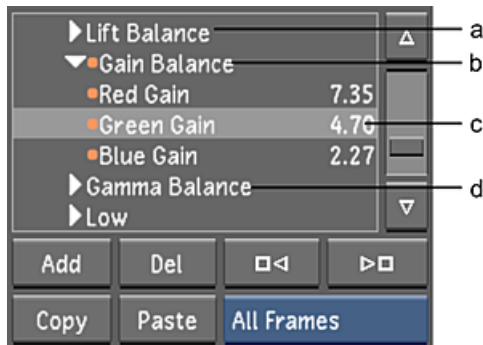
- 1 Do one of the following:
 - To zoom horizontally, hold down the right mouse button and drag to the right to increase the zoom factor and to the left to decrease it.
 - To zoom vertically, hold down the right mouse button and drag up to increase the zoom factor and down to decrease it.

TIP Hold down **Alt** while dragging to centre the zoom at the point where you began dragging.

Channel Hierarchy

channel hierarchy, using to animate channelsanimations:using the channel hierarchyUse the Channel hierarchy to select the channels to animate. In the following example, Green Gain is selected. You can then set keyframes for this channel and create an animation. See [Animating with Keyframes](#) (page 547).

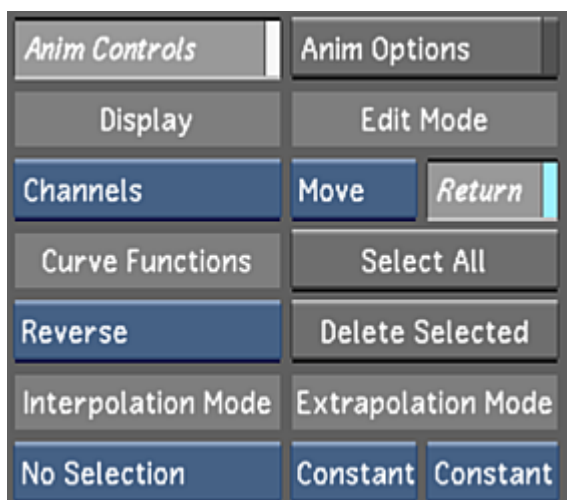
Channels are grouped together in folders. When you select a folder, all its channels are selected and all its curves appear in the Animation Curves window. You can also expand a folder and select a single channel.



(a) Collapsed folder (b) Expanded folder (c) Selected channel (d) Deselected folder

Animation Controls

keyframes:viewing selectedviewing:selected keyframeschannels:viewing selected animatedviewing:selected animated channelschannels:viewing animatedviewing:animated curveskeyframes:viewing channel ranges betweenviewing:channel ranges between keyframesUse the Animation controls to modify channels. The settings are displayed when the Anim Controls toggle button is enabled in the Animation editor or the Dissolve editor (some options are unavailable in the Dissolve editor).



Display box Toggle between displaying the Channel Editor view (Curve in previous versions of Lustre) or in Track Editor view (Timeline in previous versions).

NOTE

In the Dissolve editor, only the Channels display is available.

Tools box Select how you want to modify keyframes:

Select:	To:
Add (A)	Add a keyframe.
Move (M)	Move a keyframe.
Scale	Scale animation curves in X and Y, around a keyframe.
Delete (D)	Delete a keyframe.
Break	Break a tangent.
Repair	Repair a broken tangent.

Scale Edit Mode:

To scale animation curves in Y:

- 1 Select Scale from the Animation Editor Edit Mode drop down.
- 2 Click on the keyframe you want to use as a reference and drag up and down to scale the animation in Y around this keyframe.

To scale animation curves in X:

- 1 Select Scale from the Animation Editor Edit Mode drop down.
- 2 Click on the keyframe you want to use as a reference and drag left and right to scale the animation in X around this keyframe.

NOTE It is also possible to pre-select keyframes before selecting Scale Edit mode. In this context, only the selected keyframes are affected. Also, when scaling in X, the position of the scaled keyframes is limited by the previous or next keyframe. The value is clamped to the pre/next keyframe value.

Return button Modify a keyframe and return to Move mode.

Curve Functions box Apply a curve function to the current channel. Options are:

- Tangent R/L
- Tangent L
- Translate X
- Translate Y
- FrameSnap
- Simplify
- Jitter
- Average
- Reverse
- Invert

Select All button Selects all keyframes on the current channel.

Delete Selected button Deletes selected keyframes from the current channel.

Interpolation Mode box Select how the curve between keyframes is shaped: as a Constant, Linear, Hermite or Bezier curve; Mixed is displayed only when a selection contains keyframes with different interpolations; Natural is available only when importing timelines with dissolves from Wiretap server.

Extrapolation Mode box Select the shape of the curve before and after the first and last keyframes.

Animation Options

Use the Animation Options to determine the way in which the animation channels function. The settings are displayed when the Anim Options toggle button is enabled. The default settings for these options are set in the Animation panel of the [Tools Settings page](#) (page 93) (some options are unavailable in the Dissolve editor).



Animating with Keyframes

workflows:creating animationsanimations:workflowTo create an animation, you select channels with animatable parameters, and then you add keyframes at points in time where the parameters change. The following procedure outlines the basic steps required to create an animation.

To create an animation:

- 1 In the Channel hierarchy, select the channel or parent folder you want to animate. See [Selecting Channels](#) (page 547).
- 2 Move the positioner to the frame you wish to mark as a keyframe and then add a keyframe. See [Adding Keyframes](#) (page 548).
- 3 Set the value by dragging the keyframe or by using the individual controls in the appropriate tool.
- 4 Set the interpolation and extrapolation (if needed) for the keyframe. See [Setting Interpolation](#) (page 550) and [Setting Extrapolation](#) (page 552).
- 5 Move to the next frame and add another keyframe.
- 6 Set the keyframe value at the new position.
- 7 Make any additional modifications to the animation curve.
- 8 Move to the start of the shot and play the animation.
- 9 If necessary, use the Track Editor to adjust the animation timing. See [The Track Editor](#) (page 570).

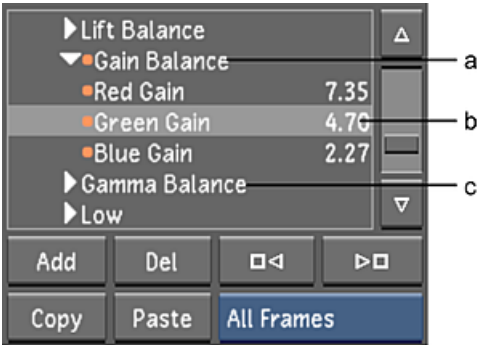
Selecting Channels

channels:selectinganimations:selecting channelsTo create an animation, you select channels with animatable parameters, and then you add keyframes at points in time for which the parameters change. You select animation channels in the Channel hierarchy. Once you select a channel, its curve appears in the Animation Curves window.

To select a channel:

- 1 In the Main menu, click Animation.
- 2 In the Channel hierarchy, expand a folder and click a channel to select it. To select all channels in the folder, select the folder.

NOTE You can also select a channel in the Animation Curves window by clicking the inactive curve. You can see inactive curves in the Animation Curves window only when the Hide Inactive Curves button in the Animation Options panel is disabled.



(a) Select folder (b) Selected channel (c) Deselected channel

Selected channels are highlighted.

- 3 Click a selected channel to deselect it.

NOTE Deselecting a channel does not change the selection state of that channel's keyframes.

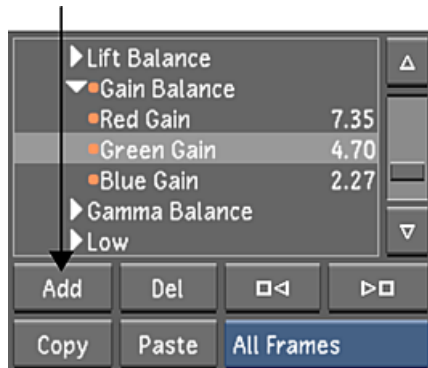
Adding Keyframes

animations:adding keyframeskeyframes:addingYou can add keyframes at any point in your animation curves. There are three methods of adding keyframes:

- Add a single keyframe to the selected channel(s) at the current position.
- Interactively add keyframes to any point on the selected curves. There must be at least one keyframe on a channel before you can interactively add keyframes.
- Set keyframes automatically when you adjust a parameter in any menu. For example, set up an animation directly in the Colour menu and then fine-tune the animation curve in the Animation Curves window.

To add a keyframe:

- 1 In the Channel hierarchy, select the channel to which you want to add a keyframe.
- 2 Move the positioner to the frame you wish to mark as a keyframe.
- 3 Click Add.

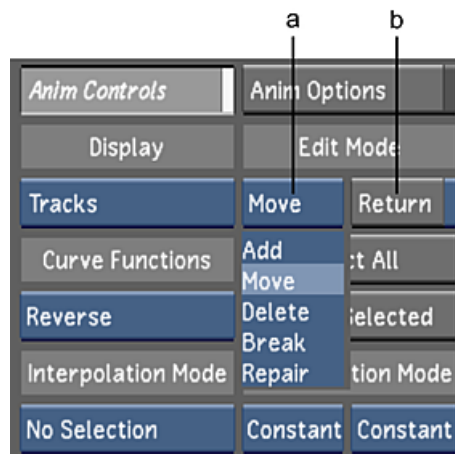


When you add a keyframe to a channel, an orange indicator appears to the left of the channel in the Channel hierarchy.

- 4 Set the channel value as needed by dragging the keyframe.
Once you add keyframes to a shot, blue markers appear in the Shot timebar indicating the location of the keyframes.

To add multiple keyframes interactively:

- 1 You must explicitly add one keyframe using the Add button or Autokey before you can add keyframes interactively in Add mode.
- 2 Display the Animation controls.



(a) Edit Mode option box (b) Return toggle button

NOTE If Return mode is enabled, you are returned to Edit mode after adding one keyframe.

- 3 In the Channel hierarchy, select the channel to which you want to interactively add keyframes.
- 4 In the Animation controls, select Add in the Edit Mode option box.
- 5 Move the mouse cursor over the animation curve.
Keyframes appear as you approach each frame.
- 6 Click the animation curve to add a keyframe at that frame.

NOTE The new keyframe is automatically set to Bezier interpolation.

Once you add keyframes to a shot, markers appears in the Shot timebar indicating the location of the keyframes.

To add keyframes in Autokey mode:

- 1 Enable AutoK.



NOTE Autokey is available from all menus in Lustre.

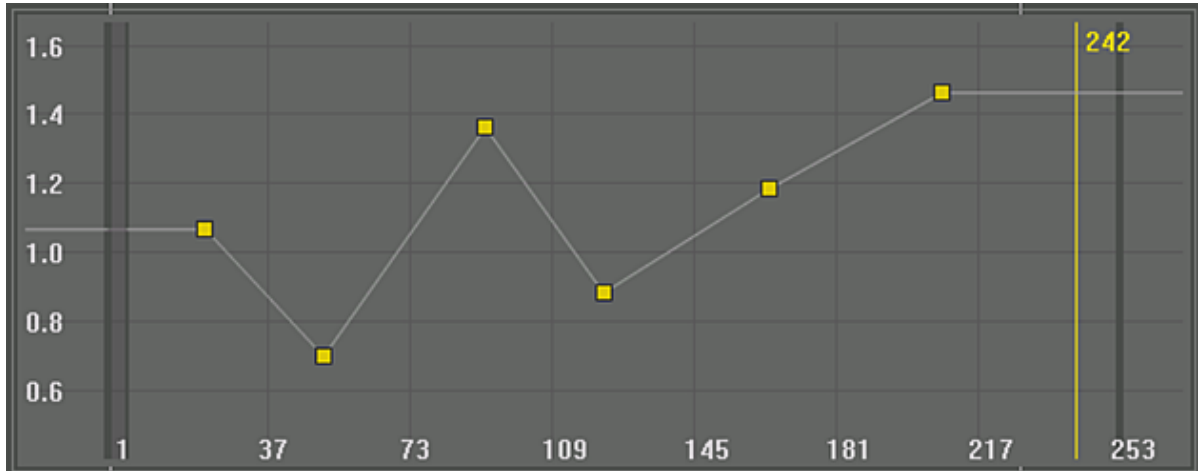
- 2 Access the tool you want to use to create the animation. For example, in the Main menu, click Colour, and then click Grading.
- 3 Move the Shot timebar to the frame where you want to add a keyframe.
- 4 Adjust the colour parameters.
A keyframe is added automatically to the channels you modified.
- 5 Move to another frame and adjust the colour parameters and set another keyframe.
- 6 Keep adjusting colour as needed.

Once you have added keyframes to a shot, blue markers appears in the Shot timebar indicating the location of the keyframes.

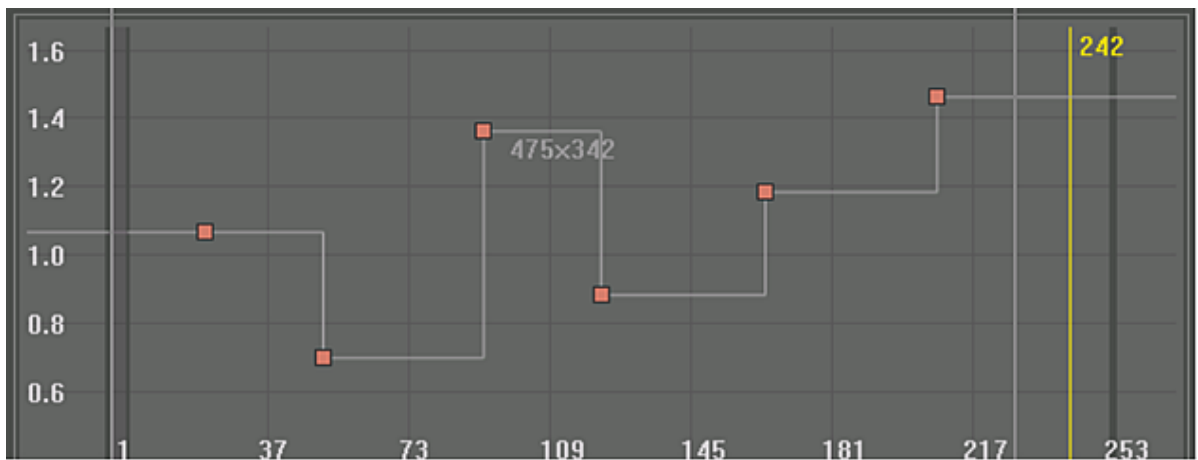
Setting Interpolation

keyframes:setting interpolation interpolation, settingInterpolation defines the shape of an animation curve between keyframes. You can choose from the following interpolation settings depending on how you want the channel values to change over time.

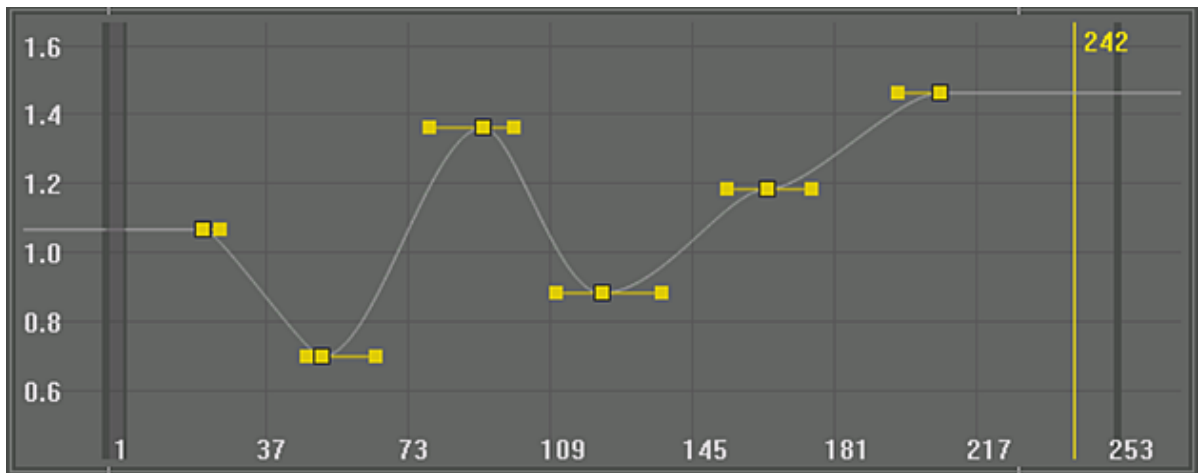
Linear Joins keyframes with a straight line.



Constant Produces a square curve. The value of one keyframe is held at a constant value until the next keyframe. This setting can produce abrupt changes between keyframes.



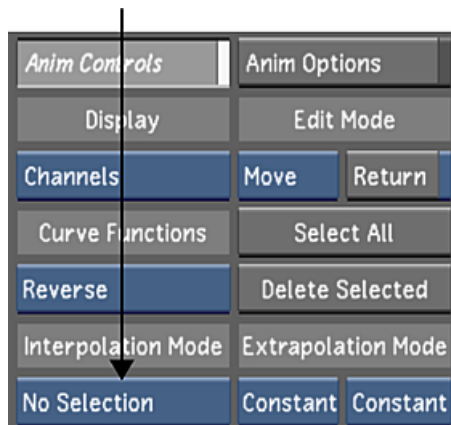
Hermite and Bezier Produces a smooth curve with a smooth transition between keyframes. Each keyframe on the animation curve has an associated tangent handle. You can change the shape of the animation curve by dragging the tangent handle. Bezier requires fewer keyframes than Hermite to produce a similar curve. This is because there are two tangents at each keyframe: one incoming, one outgoing.



NOTE You can create animation curves with mixed interpolation types.

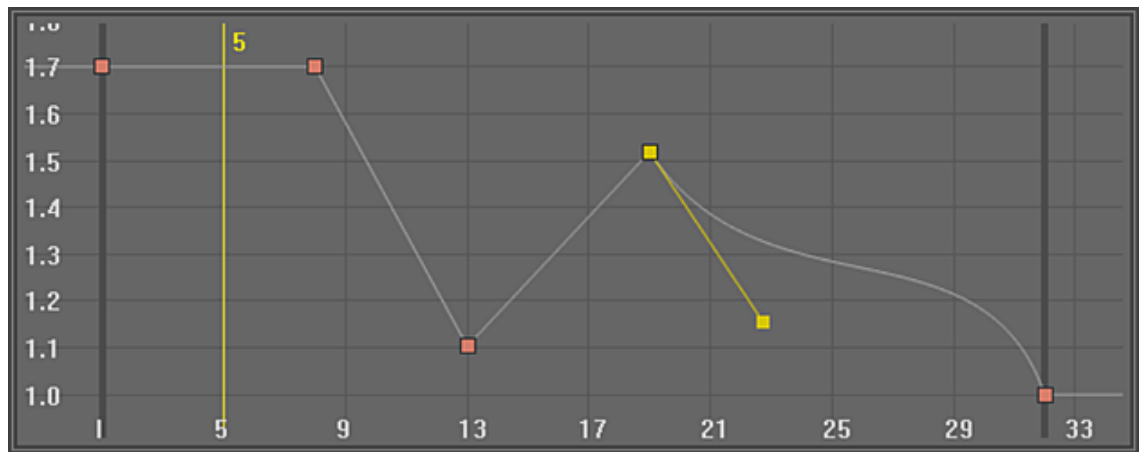
To set the interpolation type for a keyframe:

- 1 [Display the Channel Editor](#) (page 541).
- 2 Select the keyframe for which you want to set the interpolation.
- 3 In the Animation controls, select the type of curve from the Interpolation Mode option box.



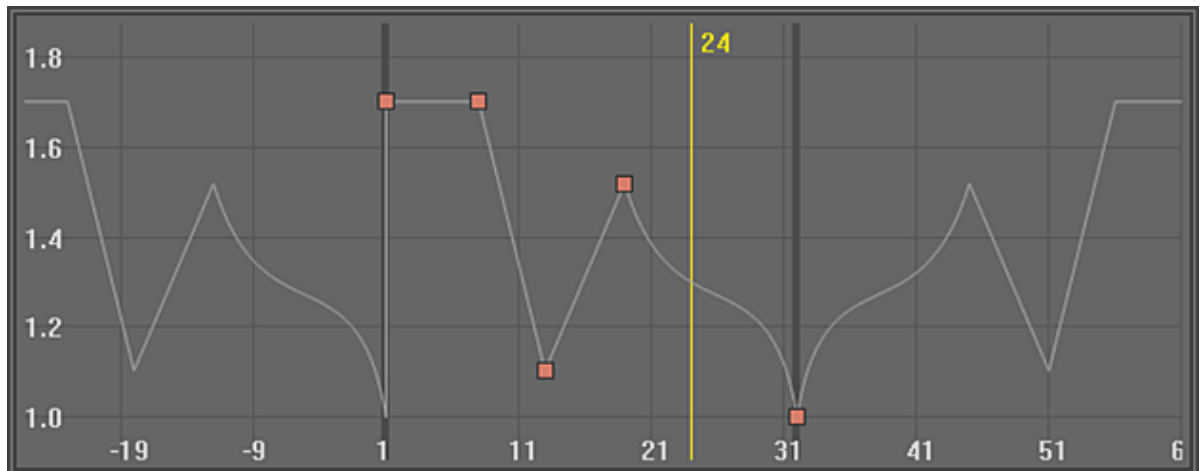
To create an animation curve with mixed interpolation:

- 1 Create an animation with at least four keyframes. Do not worry about the interpolation setting at this point.
- 2 [Display the Channel Editor](#) (page 541).
- 3 Make sure you are in Move mode and then select the first keyframe. See [Editing Keyframes](#) (page 554).
- 4 Select Constant to set the interpolation for the first keyframe to Constant.
- 5 Select the second keyframe.
- 6 Select a different interpolation mode, such as Linear.
- 7 Select the third keyframe, and then select a different mode, such as Bezier.
Your animation curve may resemble the following.



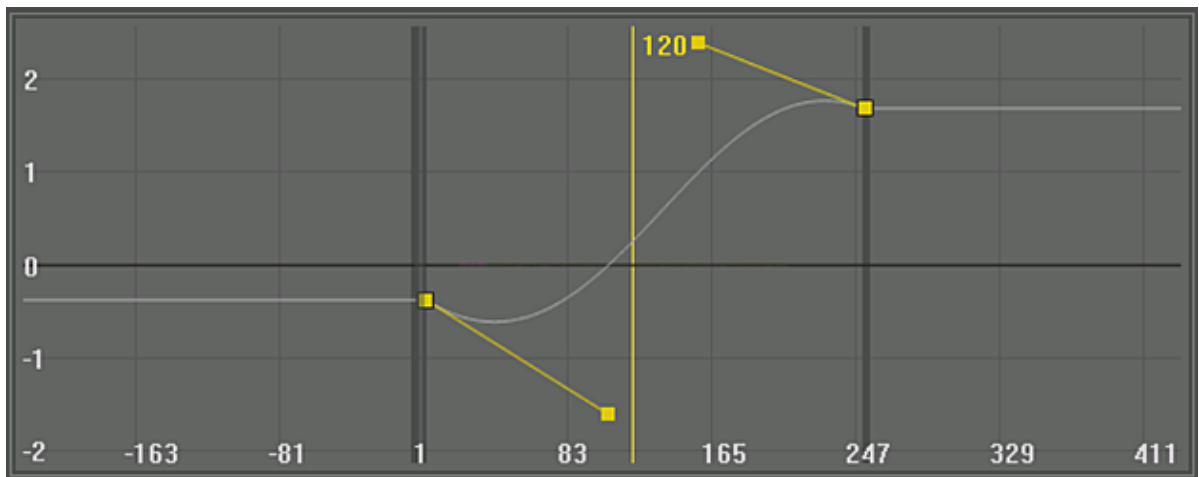
Setting Extrapolation

keyframes:setting extrapolationextrapolation, settingExtrapolation defines the shape of the animation curve outside the keyframes. You can set up a cycle in which channel values change repeatedly in the same manner over time. You can set the extrapolation before the first keyframe separately from the extrapolation after the last keyframe.

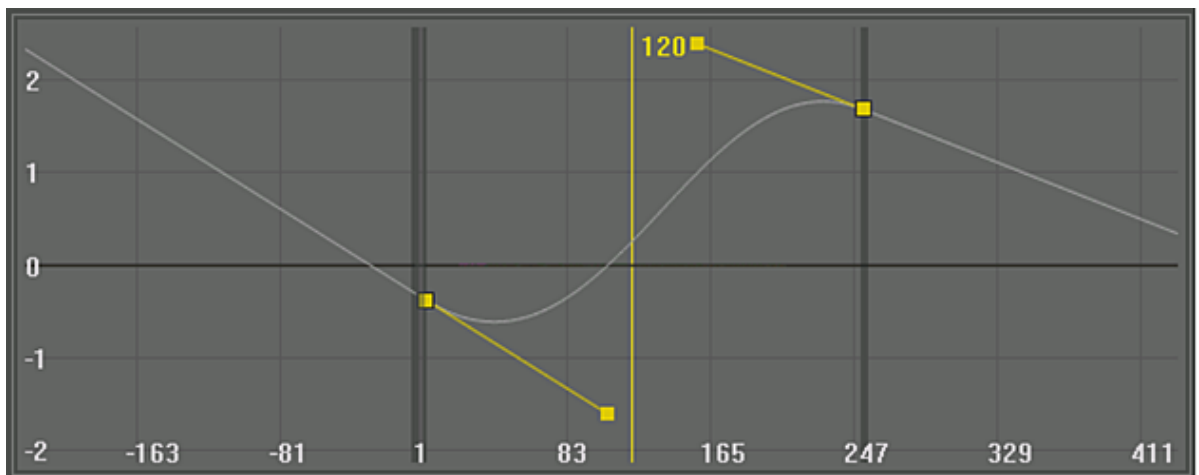


You can specify how keyframes are extrapolated using the following settings.

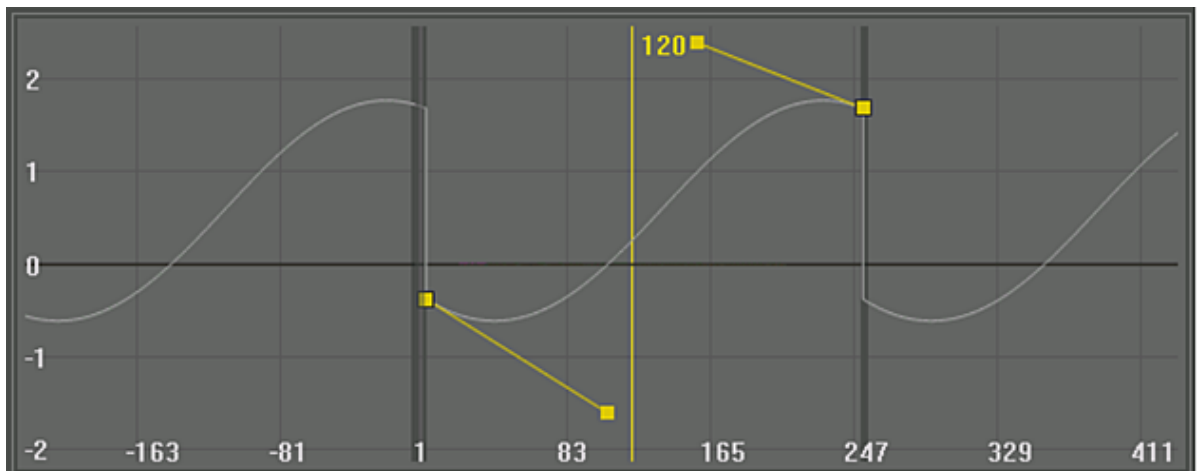
Constant Creates an extrapolated animation curve that stays at the same value as the first or last keyframe.



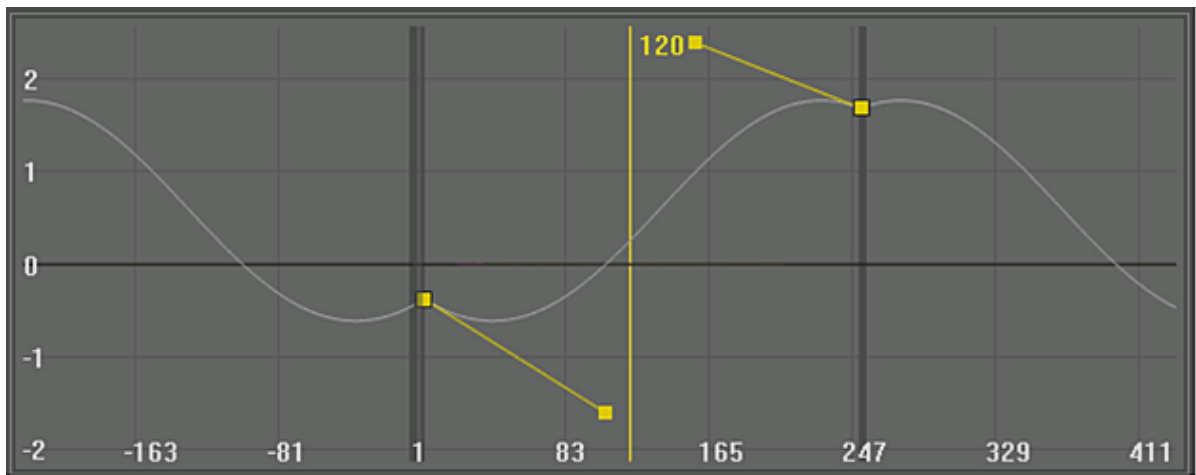
Linear Creates an animation curve that changes in a linear fashion before the first or after the last keyframe.



Repeat Creates a mirror image of the animation curve before the first or after the last keyframe.

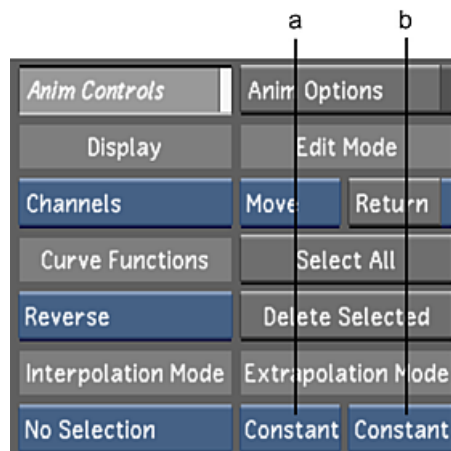


Cycle Creates a pattern of repeating keyframes before the first or after the last keyframe.



To set the extrapolation type for a channel:

- 1 Select the keyframe for which you want to set the extrapolation.
- 2 Click Animation.
- 3 Enable the Animation Controls panel.
- 4 In the Extrapolation Mode panel of the Animation controls, do any of the following:
 - In the PreType controls, click one extrapolation type button to set the extrapolation before the first keyframe.
 - In the PostType controls, click one extrapolation type button to set the extrapolation after the last keyframe.



(a) PreType Extrapolation option box (b) PostType Extrapolation option box

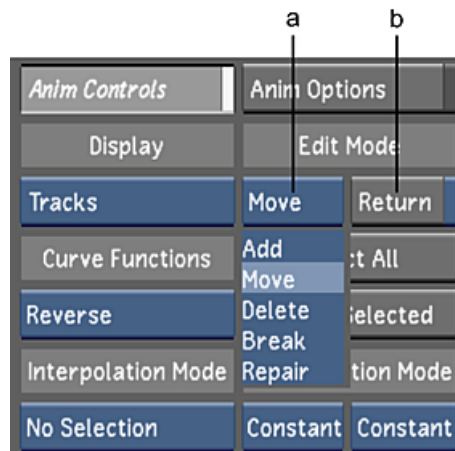
Editing Keyframes

animations:editing keyframeskeyframes:editingAs you create animations, you may need to edit keyframe values, modify animation curves, and manipulate keyframes. Make sure that you are in the appropriate Edit mode when selecting and editing keyframes.

NOTE You cannot edit keyframes in Add mode or Delete mode.

To enable Edit mode:

- 1 Click Animation.
- 2 In the Animation controls, select Add, Move, Break or Repair from the Edit Mode option box.



(a) Edit Mode option box (b) Return toggle button

NOTE To return to Move mode after editing a keyframe, enable the Return toggle button.

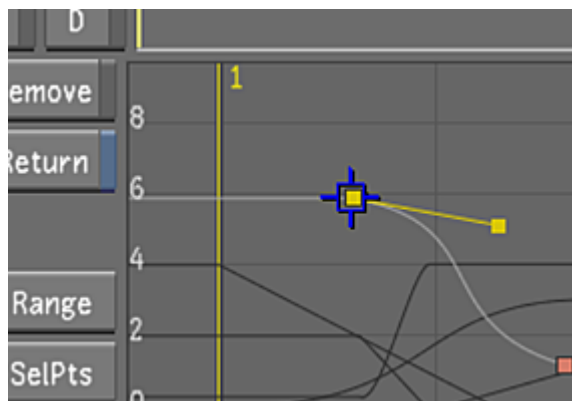
Selecting Keyframes

selecting:keyframeskeyframes:select>You need to select keyframes in order to edit them. You can select one keyframe at a time, marquee select a group of keyframes, or select all keyframes in a given channel.

Selected keyframes are yellow. Unselected keyframes are red.

To select a keyframe:

- 1 In the Animation Curves window, position the cursor over the keyframe and click.



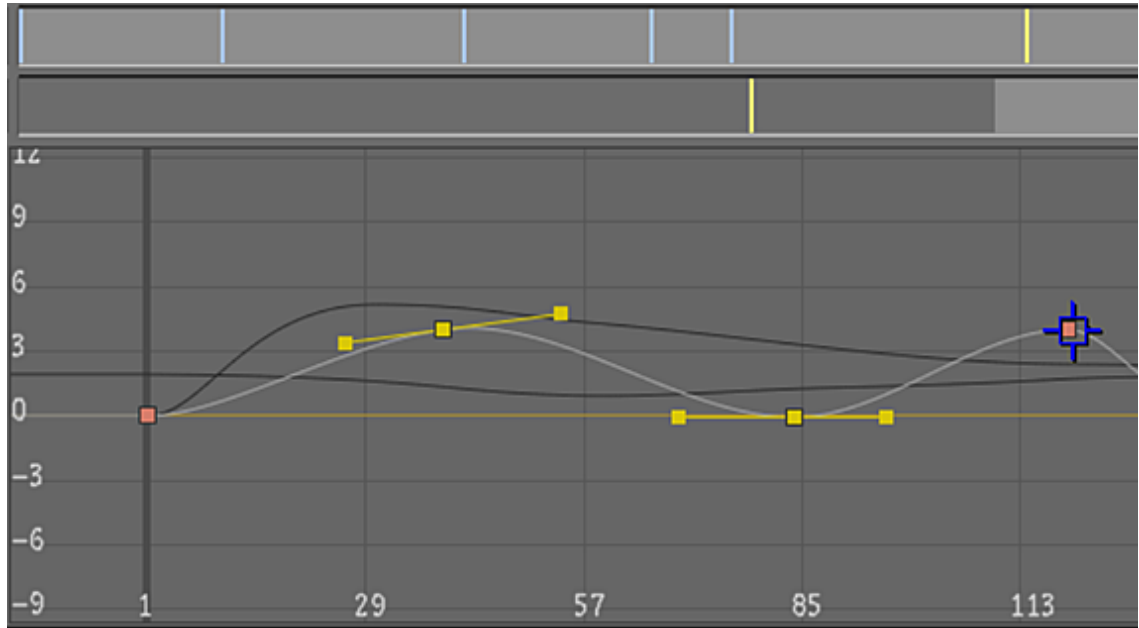
The keyframe is selected.

Once selected, you can right-click on a single key frame and modify its value with the on-screen calculator. It is also possible to enter a number on the calculator and use the up/down arrows to interactively modify the value.

To select multiple keyframes:

- 1 In the Animation Curves window, click a keyframe to select it and then hold down `Ctrl` and click additional keyframes to add them to the selection.

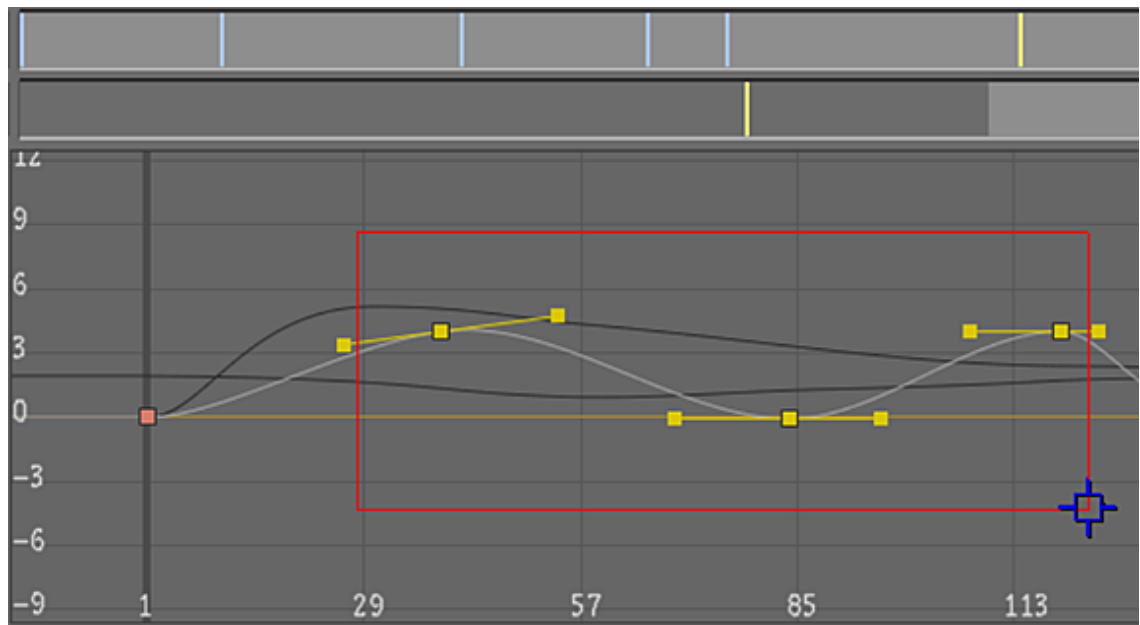
NOTE To deselect a selected keyframe, hold down `Ctrl` and click the keyframe. This is useful when you make a marquee selection but you would like not to include one or more keyframes in the selection.



If you release the `Ctrl` key and then click a keyframe, this keyframe is selected and the previous selection is cleared.

To marquee select multiple keyframes:

- 1 In the Animation Curves window, drag to draw a marquee selection rectangle around the keyframes you want to select.

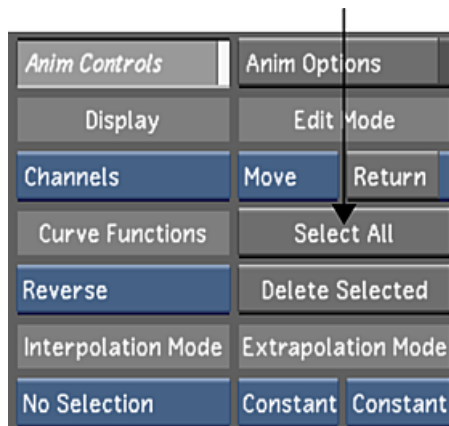


Keyframes inside the marquee selection are selected.

- 2 To zoom in on the selected area, hold down the **Alt** key when drawing the marquee selection.

To select all keyframes in the selected curve:

- 1 In the Animation Controls panel, click **Select All**.



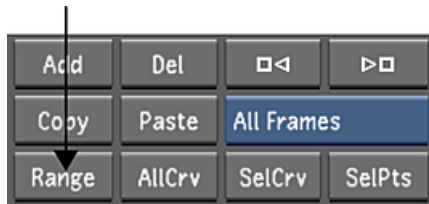
Modifying Your Animation

keyframes:modifying curvesanimations:modifying curvesThe rate at which your animation changes depends on the slope of the animation curve. A steep slope results in a more rapidly changing animation. A gradual slope represents a slower change in channel values over time. By changing the shape of the animation curve, you can modify the speed at which the animation occurs between keyframes. Although you can use Constant or Linear interpolation to create animations, with Bezier and Hermite interpolation you have much more control over the shape of the animation curve, and therefore, the speed of the animation.

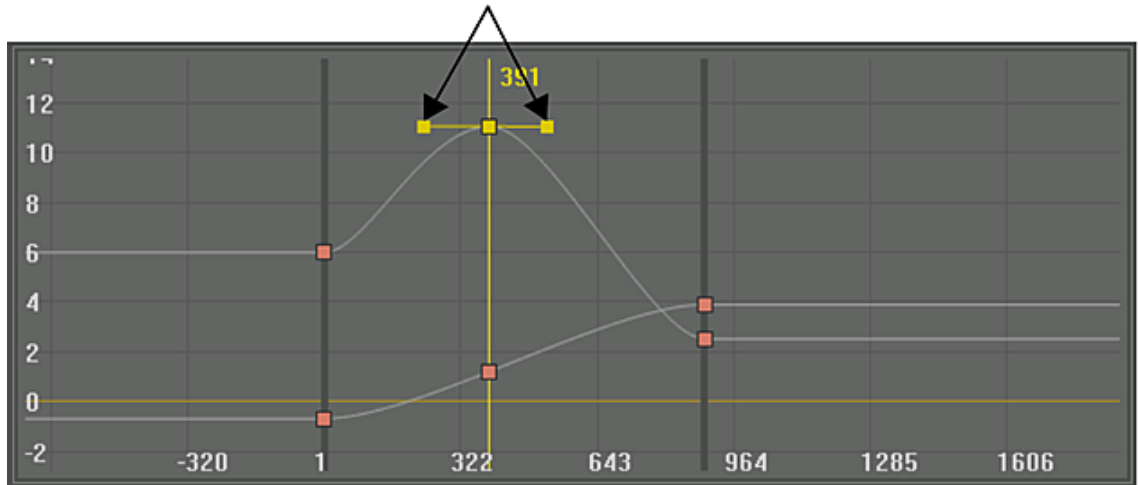
You can hide curves that are not selected. This can make it easier to manage your keyframes and modify animations.

To modify the shape of an animation curve:

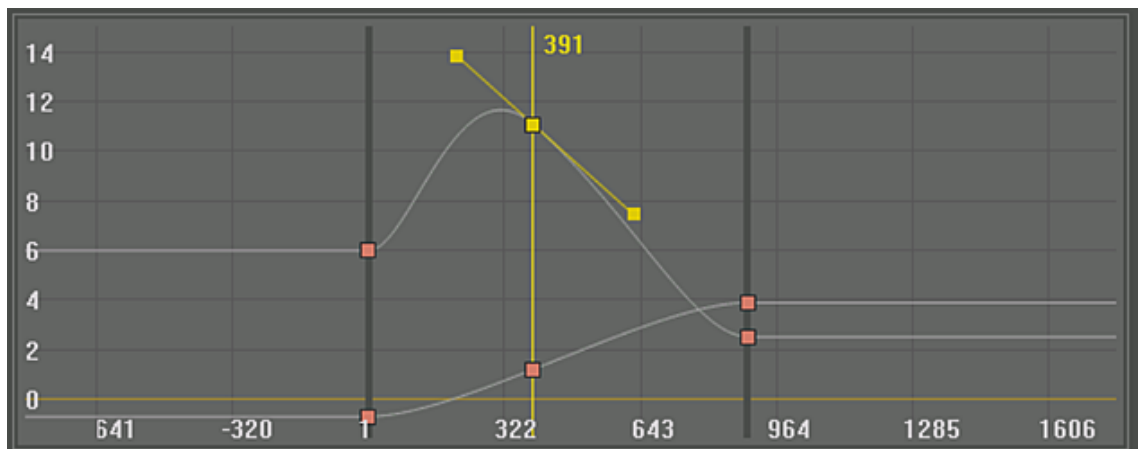
- 1 In the Channel hierarchy, select the animated channel you want to modify.
- 2 Click Range to view the entire curve between the first and last keyframes.



- 3 Select the first keyframe and set the interpolation to Bezier. A pair of Bezier tangent handles appear for the selected keyframe.

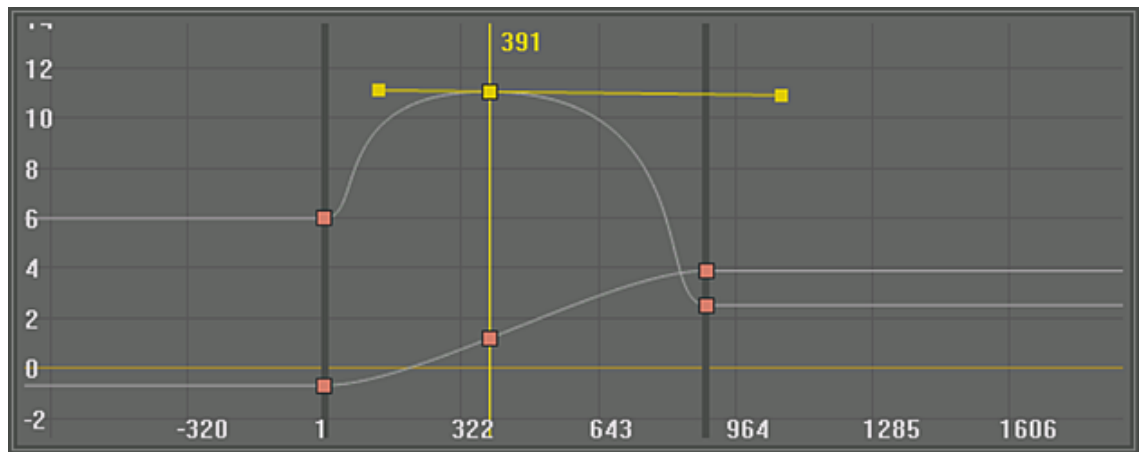


- 4 Drag one of the tangent handles. The shape of the curve changes as you move the tangent handle.



NOTE When you drag a tangent handle, its adjacent tangent handle moves in the opposite direction. If you want to move the tangent handles independently, you need to first break them. See [Breaking Tangent Handles](#) (page 559).

- 5 You can lengthen a tangent handle independently without breaking the pair.



To hide curves that are not in use:

- 1 Enable the [Animation Options](#) (page 546) panel.
- 2 Enable the Hide Inactive Curves toggle button.

Synchronizing Keyframe Functionality

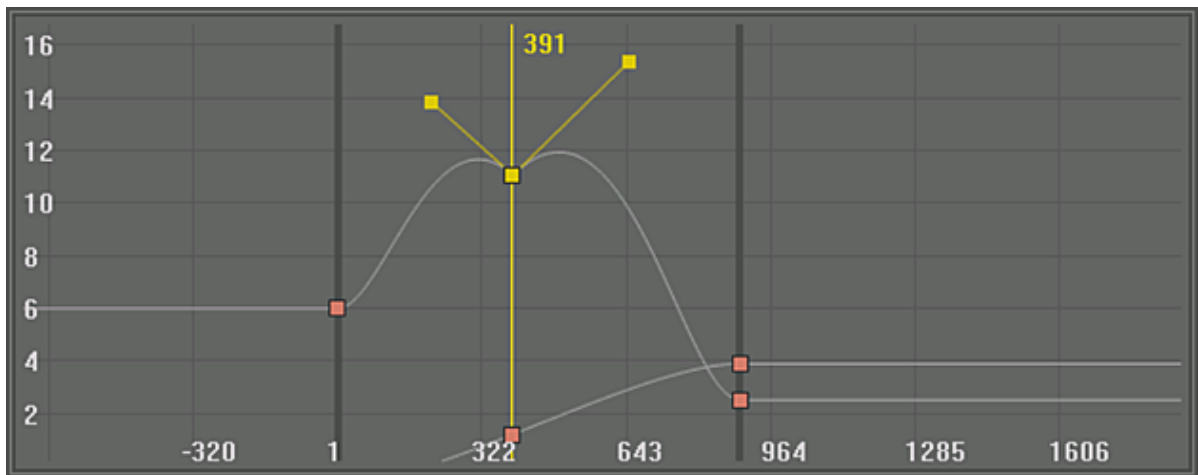
dissolves:animatinganimating:dissolvesWhen you assemble with the Record base of assembly, dissolved shots become one shot on the timeline and the dissolve start and end points are automatically keyframed. The ACS Animation System option ensures consistent keyframe animation functionality between the control surface and the Lustre user interface. This means that if you modify colour settings that occur before the dissolve, the colour settings will fade into the next shot correctly whether you are using the control surface or the user interface.

To ensure consistent keyframe functionality between the control surface and the user interface:

- 1 Click Animation.
- 2 Enable the [Animation Options](#) (page 546).
- 3 Enable the ACS Animation System button.

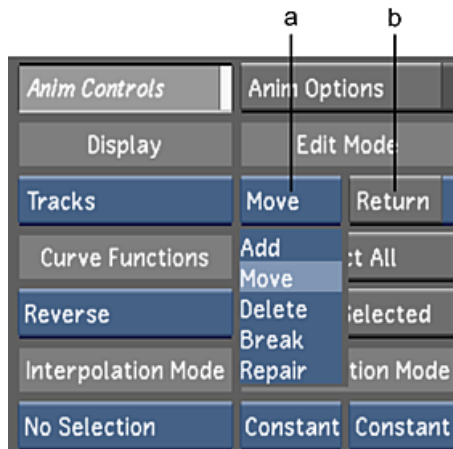
Breaking Tangent Handles

tangents:breaking for animationsanimations:breaking tangent handlesNormally when you move one Bezier or Hermite tangent handle, the other moves in the opposite direction. You can break tangent handles so that you can adjust each tangent independently and create abrupt changes in your animation.



To break a tangent handle:

- 1 In the Edit Mode option box, select Move to select the keyframes you want to break. You can also click Select All to select all keyframes.



(a) Edit Mode option box (b) Return toggle button

- 2 In the Edit Mode option box, select Break.

NOTE If you want to break the tangents for more than one keyframe, disable Return. If Return mode is enabled, you are returned to Edit mode after performing one break operation.

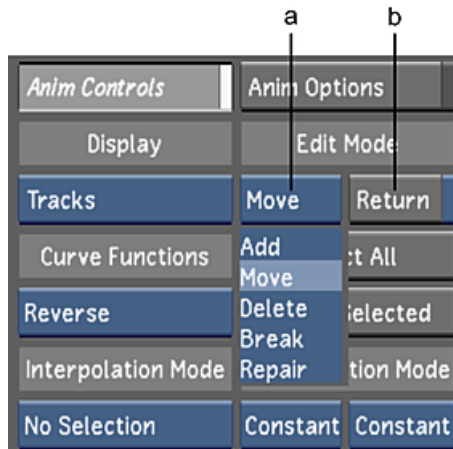
- 3 In the Animation Curves window, click and drag the selected tangent handle you want to break.
- 4 If Return mode is disabled, click additional keyframes to break the tangent handles and modify them as needed.

Resetting Tangent Handles

tangents:resetting broken handlesanimations:resetting tangentsUse Repair mode to reset broken tangent handles to an unbroken state.

To reset broken tangent handles:

- 1 In the Edit Mode option box, select Move to select the broken keyframes you want to repair. You can click the Select All button to select all keyframes.



(a) Edit Mode option box (b) Return toggle button

- 2 In the Edit Mode option box, select Repair.
All broken tangent handles for the selected keyframes are restored to an unbroken state.

Hiding Tangent Handles

animations:hiding handles
animations:hiding inactive tangents
You can hide tangent handles for keyframes that are not selected.

To hide inactive tangent handles:

- 1 Click Animation.
- 2 Enable the [Animation Options](#) (page 546).
- 3 Enable the Hide Inactive Tangents toggle button.

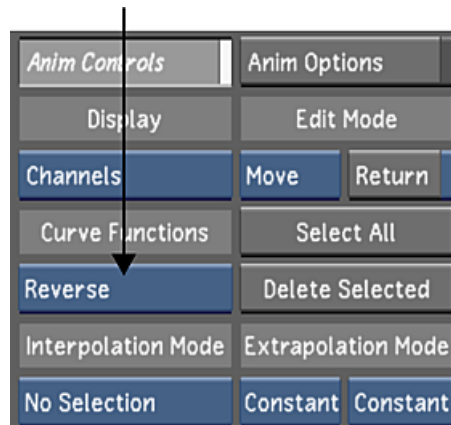
Applying Curve Functions to Keyframes

animations:reversing keyframe order
keyframes:reversing order
You can apply curve functions to keyframes, in the Animation Editor.

To apply curve functions to keyframes:

- 1 Click Animation.
- 2 In the Channel hierarchy, select the channel to which you want to apply a curve function.
- 3 Enable the Animation Controls panel.
- 4 In the Curve Functions option box, select the curve function you want to apply. Options are:
 - Tangent R/L
 - Tangent L
 - Translate X
 - Translate Y

- FrameSnap
- Simplify
- Jitter
- Average
- Reverse
- Invert



The curve function is applied to the selected channel's keyframes.

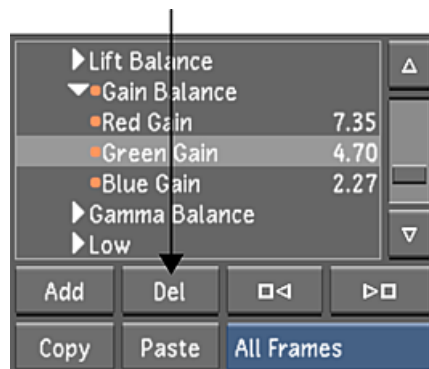
Deleting Keyframes

deleting:keyframeskeyframes:deletingYou can delete keyframes when they are no longer needed. You can:

- Delete a single keyframe.
- Delete a selection of keyframes.
- Delete keyframes interactively, enabling you to click directly on keyframes in the Animation Curves window to delete them.

To delete one keyframe:

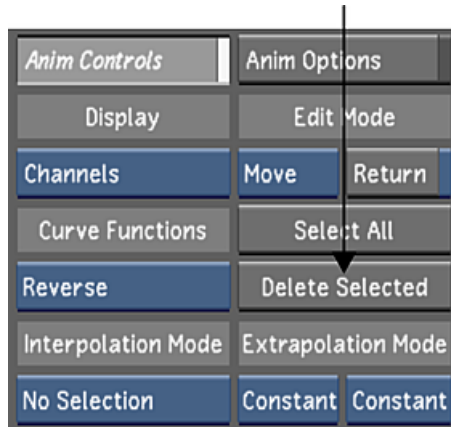
- 1 Scrub the positioner to the frame with the keyframe you want to delete.
- 2 Click the Delete button.



The selected keyframe is deleted.

To delete a selection of keyframes:

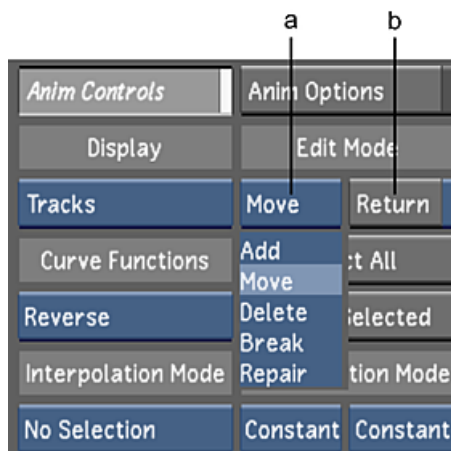
- 1 In the Tools box, select Move.
- 2 In the Animation Curves window, select the keyframes you want to delete.
- 3 Enable the Animation Controls.
- 4 Click Delete Selected and then confirm the deletion. You can also press `Delete`.



The selected keyframes are deleted.

To delete multiple keyframes interactively:

- 1 Enable the Animation Controls.
- 2 In the Tools box, select Delete.



(a) Edit Mode option box (b) Return toggle button.

NOTE Disable Return if you want to delete multiple keyframes. If Return mode is enabled, you are returned to Edit mode after deleting one keyframe.

- 3 In the Animation Curves window, click a keyframe to delete it.
- 4 You can click to delete as many keyframes as needed.

Copying and Pasting Keyframes

copying:keyframeskeyframes:copying and pasting Copying and pasting keyframes or a group of keyframes (animation curves) eliminates the need for manually duplicating your creative accomplishments. With copying and pasting, you only need to set up a keyframe or an animation curve once and then you can reuse it as many times as your project demands. With Lustre, you can easily copy a single keyframe or animation curves from a source channel or folder (group of channels) and paste them in a target channel or folder in the Channel hierarchy.

You can copy and paste any keyframe or animation curve from any channel to any other channel.

NOTE A red dot next to a channel or folder indicates keyframes or animation curves have been applied.

There are three different tools you can use to perform a copy and paste procedure:

- The user interface. See [About the Copy/Paste Keyframe Controls](#) (page 564).
- Keyboard shortcuts. See [About Copy/Paste Keyboard Shortcuts](#) (page 565).
- The Autodesk Control Surface (ACS). See the *Autodesk Control Surface User Guide*.

There are four main ways to copy and paste keyframes:

- On the current frame. See [Copying and Pasting Keyframes on the Current Frame](#) (page 565).
- All of the keyframes in the shot. See [Copying and Pasting All Keyframes in a Shot](#) (page 566).
- A manual selection of keyframes. See [Copying and Pasting a Selection of Keyframes](#) (page 567).
- Over a selection of keyframes. See [Copying and Pasting Over a Selection of Keyframes](#) (page 568).

In the case where you want to create a dissolve using keyframes, you can paste a sequence of keyframes that exceeds the target shot boundary.

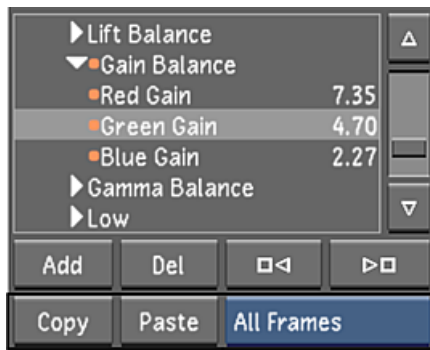
See [Pasting a Keyframe Sequence That Exceeds a Shot Boundary](#) (page 569).

About the Copy/Paste Keyframe Controls

The Copy/Paste Keyframe controls are located in the Channel hierarchy, which is displayed in the user interface in all but the following menus:

- Editing > Timeline
- Editing > Capture
- Editing > Playout
- Colour > Timeline

The Channel hierarchy and Copy/Paste Keyframe controls do, however, remain operational, even though they are not displayed in these menus. Any Copy Keyframe actions and channel/folder selections you perform remain active, even after you leave the Channel hierarchy.



a

(a) Copy/Paste Keyframe controls

Copy Click to copy one or more keyframes to memory. The Copy function is dependent on what is selected in the Channel hierarchy, the location of the positioner, and whether One Fr or All Fr is enabled.

Paste Click to paste the copied keyframes held in memory. The Paste function is dependent on the location of the positioner, and whether or not keyframes are selected in the target channel or folder.

Frame Selection option box Select whether to copy the current keyframe present at the location of the positioner (One Frame) or all keyframes (All Frames) for a selected channel or folder.

NOTE If you manually select keyframes in the Channel Editor, you do not need to use the Frame Selection option box. Lustre automatically copies and pastes the selected keyframes.

About Copy/Paste Keyboard Shortcuts

You can use the copy/paste keyboard shortcuts in any of Lustre's menus to copy and paste keyframes. For the procedures below, the following keyboard shortcuts can be used:

- CTRL (left) +C to copy keyframes
- CTRL (left) +V to paste keyframes

See [Animation](#) (page 744) for a complete list of Animation keyboard shortcuts.

Copying and Pasting Keyframes on the Current Frame

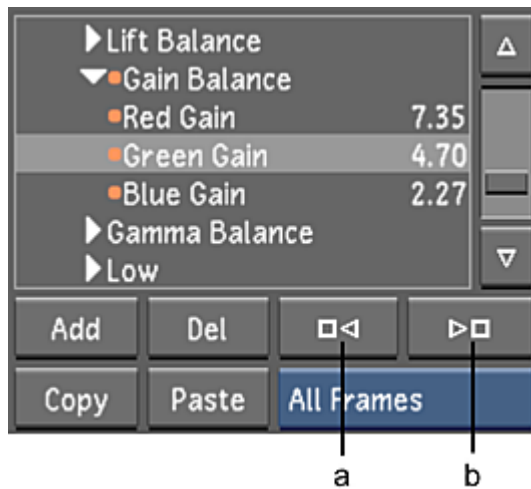
This procedure enables you to copy from the source only the keyframes on the current frame and paste them in the target where the positioner is located. copying:keyframeskeyframes:copying

To copy and paste only the keyframes on the current frame:

- 1 Navigate to the shot from which you want to copy keyframes.
- 2 In the Channel hierarchy, select the source channel or folder whose keyframes you want to copy.

TIP If you want to view the entire range of keyframes for the selected channel or folder, click Range in the Animation > Curves menu.

- 3 Set the copy mode. Do one of the following:
 - In the Frame Selection option box, select One Frame.
 - Use the ACS.
- 4 Click the Next or Previous buttons to navigate to the keyframes that you want to copy.



(a) Previous button (b) Next button

The positioner moves to the next keyframe in the sequence.

- 5 When you have located the appropriate keyframes, do one of the following:
 - Click Copy.
 - Press CTRL (left) +C.
 - Use the ACS.
- 6 Navigate to the target shot and then place the positioner on the frame where you want to paste the keyframes.
- 7 In the Channel hierarchy, select the target channel or folder into which you want to paste the copied keyframes.

NOTE If there are keyframes present in a channel or folder at the location of the positioner, they will be overwritten.

- 8 Paste the keyframes held in memory. Do one of the following:
 - Click Paste.
 - Press CTRL (left) +V.
 - Use the ACS.

The shot is updated in the Player with the pasted keyframe data.

Copying and Pasting All Keyframes in a Shot

Copying a sequence of keyframes and pasting it in a target that has no keyframes selected, overwrites any keyframe data that are present, beginning at the location of the positioner (for the length of the source sequence). For example, if the source sequence of keyframes is ten frames long, then only ten frames of keyframes are overwritten in the target, beginning at the location of the positioner.

NOTE Should the pasted keyframes extend beyond the target shot boundary, see [Pasting a Keyframe Sequence That Exceeds a Shot Boundary](#) (page 569).

This procedure enables you to copy all of the keyframes in a shot for the selected source channel or folder, regardless of the location of the positioner, and paste them in a target channel or folder, starting from where the positioner is located. copying:keyframeskeyframes:copying

To copy and paste all of the keyframes in the shot for the selected channel or folder:

- 1 Navigate to the shot from which you want to copy keyframes.
- 2 In the Channel hierarchy, select the source channel or folder whose keyframes you want to copy.
- 3 Set the copy mode. Do one of the following:
 - In the Frame Selection option box, select All Frames.
 - Use the ACS.
- 4 Copy all the keyframes. Do one of the following:
 - Click Copy.
 - Press `CTRL (left) +C`.
 - Use the ACS.
- 5 Navigate to the target shot and then place the positioner on the frame where you want to paste the keyframes.
- 6 Select the target channel or folder into which you want to paste the copied keyframes.
NOTE If there are keyframes present in a channel or folder at the location of the positioner, they will be overwritten.
- 7 Paste the keyframes held in memory. Do one of the following:
 - Click Paste.
 - Press `CTRL (left) +V`.
 - Use the ACS.

The shot is updated in the Player with the pasted keyframe data.

Copying and Pasting a Selection of Keyframes

This procedure enables you to copy a manual selection of keyframes in a shot for the selected channel or folder. copying:keyframeskeyframes:copying

To copy and paste a selection of the keyframes in the shot for the selected channel or folder:

- 1 Navigate to the shot from which you want to copy keyframes.
- 2 In the Channel hierarchy, select the source channel or folder whose keyframes you want to copy.
- 3 Click Range to view the entire range of keyframes for the selected channel or folder.
- 4 Select the keyframes you wish to copy. See [Selecting Keyframes](#) (page 555).
- 5 Copy the selected keyframes. Do one of the following:
 - Click Copy.
 - Press `CTRL (left) +C`.
 - Use the ACS.
- 6 Navigate to the target shot and then place the positioner on the frame where you want to paste the keyframes.
- 7 Select the target channel or folder into which you want to paste the copied keyframes.
NOTE If there are keyframes present in a channel or folder at the location of the positioner, they will be overwritten.

- 8 Paste the keyframes held in memory. Do one of the following:
 - Click Paste.
 - Press CTRL (left) +V.
 - Use the ACS.

The shot is updated in the Player with the pasted keyframe data.

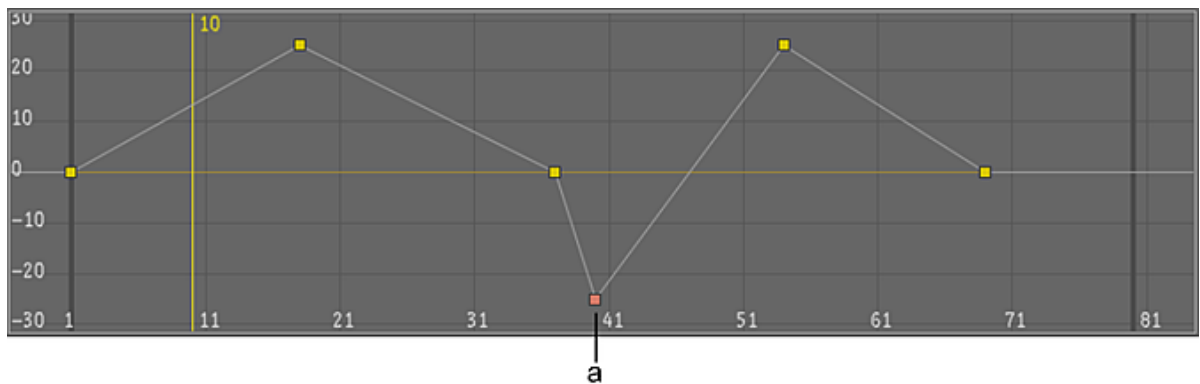
Copying and Pasting Over a Selection of Keyframes

This procedure enables you to copy and paste keyframes over a selection of existing target keyframes while preserving unselected target keyframe(s).

To copy and paste keyframes over a selection of keyframes:

- 1 Navigate to the shot from which you want to copy keyframes.
- 2 In the Channel hierarchy, select the source channel or folder whose keyframes you want to copy.
- 3 Click Range to view the entire range of keyframes for the selected channel or folder.
- 4 Select the keyframes you wish to copy. See [Selecting Keyframes](#) (page 555).
- 5 Copy the selected keyframes. Do one of the following:
 - Click Copy.
 - Press CTRL (left) +C.
 - Use the ACS.
- 6 Navigate to the target shot and then place the positioner on the frame where you want to paste the keyframes.
- 7 Select the target channel or folder into which you want to paste the copied keyframes.
- 8 In the Animation Curves window, manually select the keyframes that you want to overwrite with the copied keyframe data.
- 9 Paste the keyframes held in memory. Do one of the following:
 - Click Paste.
 - Press CTRL (left) +V.
 - Use the ACS.

In the Animation Curves window, unselected keyframe(s) are preserved, as seen in the following example.

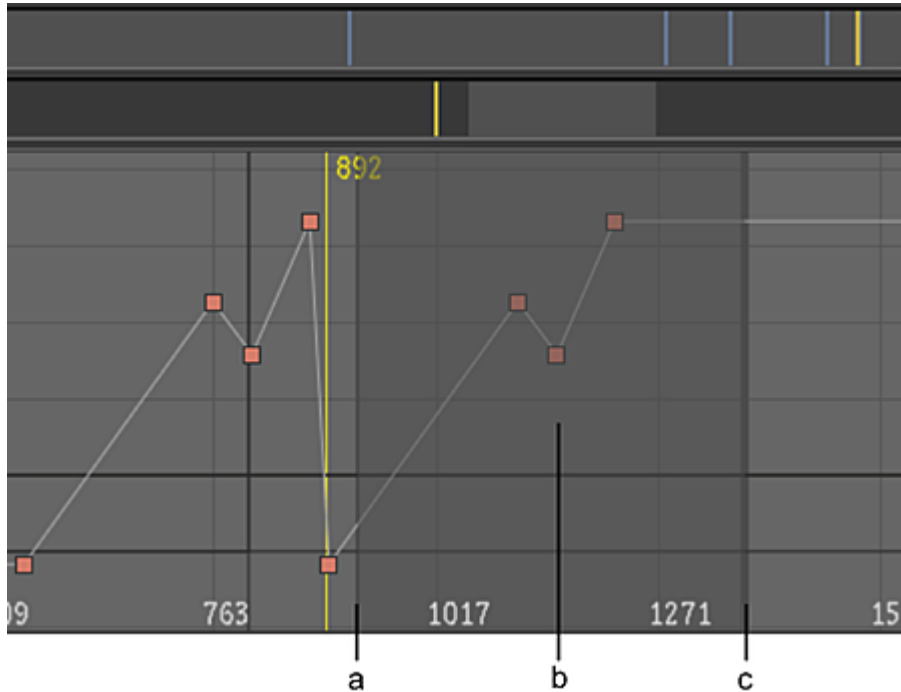


(a) Keyframe preserved

Pasting a Keyframe Sequence That Exceeds a Shot Boundary

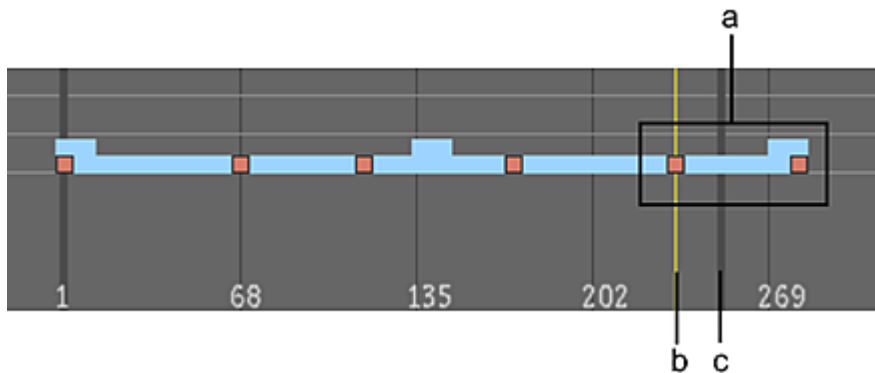
pasting, keyframeskeyframes:pastingPasting a keyframe sequence that extends beyond the boundary of the target shot can be really useful when creating a dissolve. See [Creating Dissolves](#) (page 272).

The target shot can be shorter in length than the keyframe sequence due to its actual length or its having been trimmed. When you copy and paste a keyframe sequence that exceeds the boundary of the target shot that has been trimmed, the excess keyframes in the sequence are still pasted, but they appear in a greyed out area. The greyed out area represents the available handles of a trimmed shot and contains the “inactive” keyframes, as seen in the following example. This means the keyframes are available for creating a dissolve.



(a) Shot boundary (b) Excess keyframe data (c) Beginning of next shot

You can also paste a keyframe sequence to a target shot that is of equal or greater length and then manually trim the shot. The keyframes will still exist in the handles (greyed out area). The excess keyframes can also be viewed in the [Track Editor](#) (page 570).



(a) Pasted keyframe sequence (b) Positioner (where first of copied keyframes is pasted) (c) Shot boundary

Guidelines for Geometries, Point Trackers, and Effects Plugins

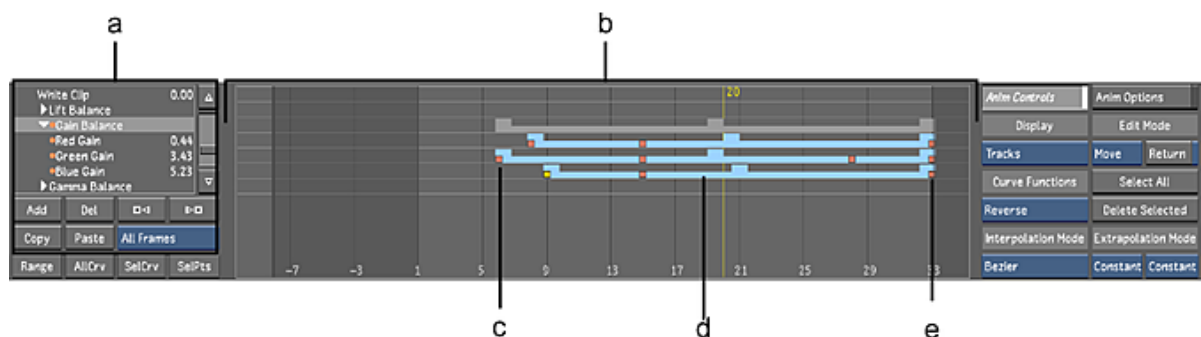
When copying and pasting keyframes for geometries, point trackers, and Effects plugins, you need to be aware of the following guidelines:

- When there are more source channels in the copy buffer than there are corresponding channels in the target, Lustre will match channels (in top-to-bottom order) with their corresponding target channels. Non-matching channels will not be pasted.
- Axes are not saved with absolute values; therefore, it is not possible to copy and paste an axis while maintaining its original position. If you perform such an action, you will have to manually modify the appropriate axis channel values.

The Track Editor

timing, adjusting for animations:adjusting timingUse the Track Editor to adjust animation timing after you create an animation. With the Track Editor, you can select and view all the keyframes and channels in your animation, but you do not see the animation curves. Instead, you see a track representation of each animation curve. Using the handles on the track, you can move the keyframes in time, but you cannot modify their value. This makes it easier to change animation timing to match on-screen occurrences.

In the Track Editor, channels are represented by horizontal bars called *tracks*. The channel name appears in the Channel hierarchy to the right of the Track Editor.



(a) Channel hierarchy (b) Track Editor (c) First keyframe in channel (d) A selected channel (e) Last keyframe in channel

The position and length of a track is determined by the first and last keyframes of the channel it represents. The track extends from the frame number of the first keyframe to the frame number of the last keyframe.

Light blue tracks represent selected channels. Dark blue tracks are for deselected channels. Grey tracks represent folders that contain at least one animatable channel.

Superimposed over each track are small orange squares that represent the position of the channel's existing keyframes. You can adjust the position of these keyframes without affecting their channel value.

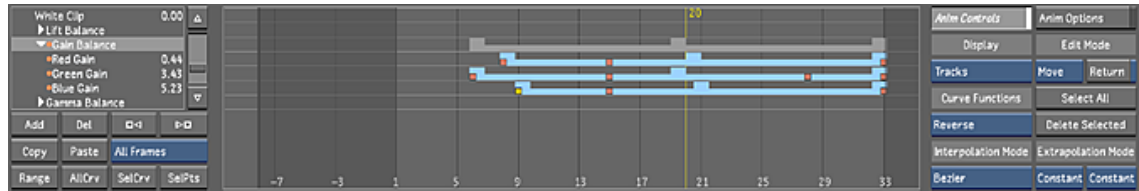
Accessing the Track Editor

Use the Track Editor to adjust animation timing for an existing animation.

To access the Track Editor:

- 1 Click Animation.
- 2 Enable the Animation Controls.
- 3 In the Display option box, select Tracks.

The Track Editor appears.



Selecting Tracks

Before you can adjust an animation's timing, you must select the channel in the Channel hierarchy.

To select a channel in the Channel hierarchy:

- 1 [Display the Track Editor](#) (page 570).
- 2 In the Channel hierarchy, either select a folder (to select all channels), or expand a folder and select individual channels.

Selected channels are light blue. Deselected channels are dark blue.

Adjusting Animation Timing

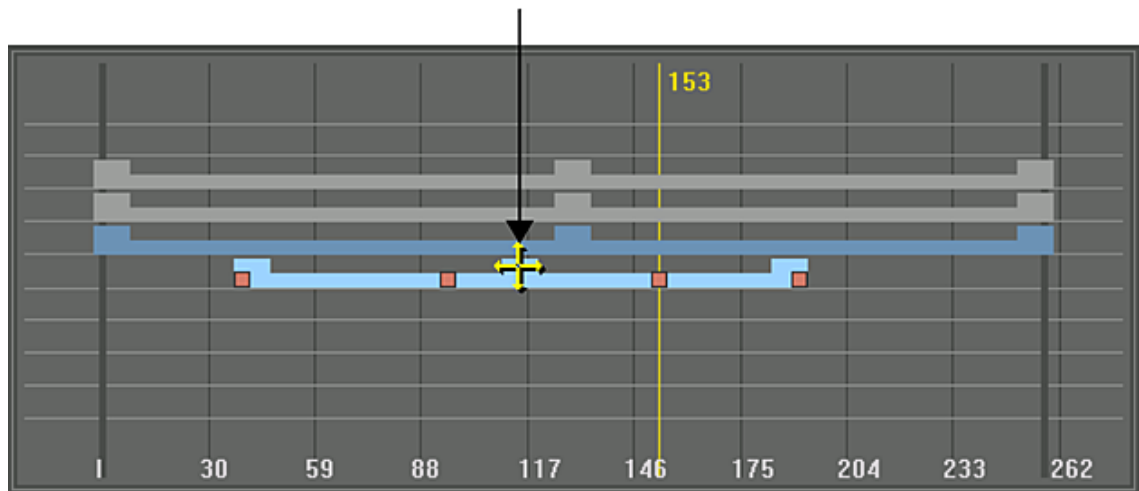
Using the Track Editor, you can adjust a keyframe's timing without adjusting its value. You can also slide the entire animation ahead or back in time, and change the duration of an animation.

To adjust the timing for an entire channel:

- 1 [Display the Track Editor](#) (page 570).
- 2 In the Channel hierarchy, select the channel you want to modify.
The corresponding track in the Track Editor turns light blue and its keyframes appear.

TIP Click Range to see all three track handles.

- 3 In the Tools box, select Move.
- 4 Move the mouse over the centre light-blue handle. When the four-direction arrow cursor appears, drag to the left or right to slide the entire animation forward or backward in time.



NOTE Adjusting timing for a folder changes the timing for all channels in that folder.

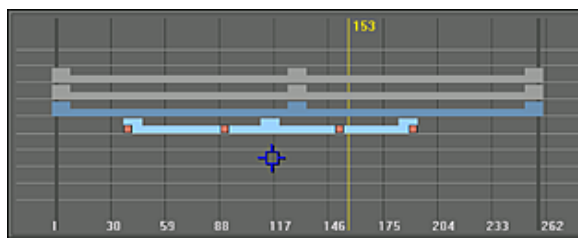
To adjust keyframe timing:

- 1 [Display the Track Editor](#) (page 570).
- 2 In the Channel hierarchy, select the channel you want to modify.
The corresponding track in the Track Editor turns light blue and its keyframes appear.
- 3 In the Tools box, select Move.
- 4 Drag the keyframe to the left or right to slide the keyframe forward or backward in time.

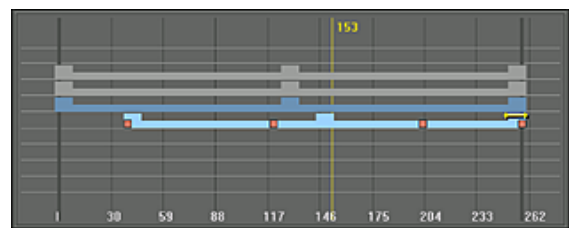
NOTE Dragging a keyframe in the Track Editor does not change the channel value.

Adjusting Animation Scaling

keyframes:scaling to adjust animation durationanimations:adjusting durationUsing the Track Editor, you can independently modify the animation's start or end point. This changes the animation's overall duration and scales the keyframes. Dragging the start or end point compresses or stretches the keyframes in the selected channels. If you want to simply move the first or last keyframe to another point in time, drag the keyframe.



a



b

(a) Before scaling keyframes (b) After scaling keyframes

NOTE By repositioning the start or end point, you cannot delete any existing keyframes. This means that you can only adjust the start or end time as far as the adjacent keyframe.

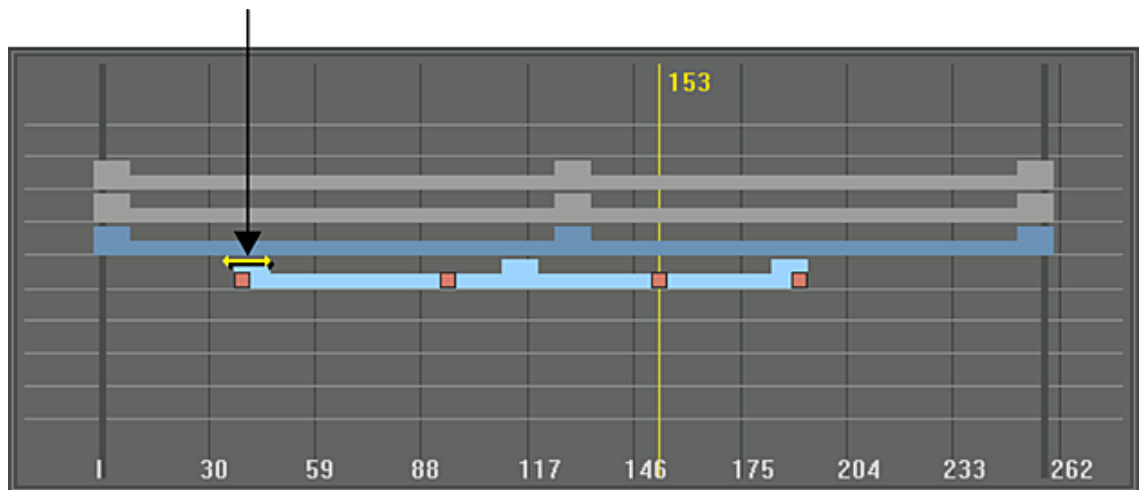
To adjust an animated channel's start or end point:

- 1 [Display the Track Editor](#) (page 570).
- 2 In the Channel hierarchy, select the channel you want to modify.
The corresponding track in the Track Editor turns light blue and its keyframes appear.
- 3 In the Tools box, select Move.
- 4 Select the first or last keyframe and drag it to change the start or end point of the animation.

NOTE Adjusting the timing for a folder changes the timing for all channels in that folder.

To scale an animated channel's timing:

- 1 [Display the Track Editor](#) (page 570).
- 2 In the Channel hierarchy, select the channel you want to modify.
The corresponding track in the Track Editor turns light blue and its keyframes appear.
- 3 In the Tools box, select Move.
- 4 Move the mouse over the starting light-blue handle. When a two-directional arrow cursor appears, drag to the left or right to slide the start point forward or backward in time.



As you drag the handle, the keyframes in the track scale proportionally to the amount you move the handle.

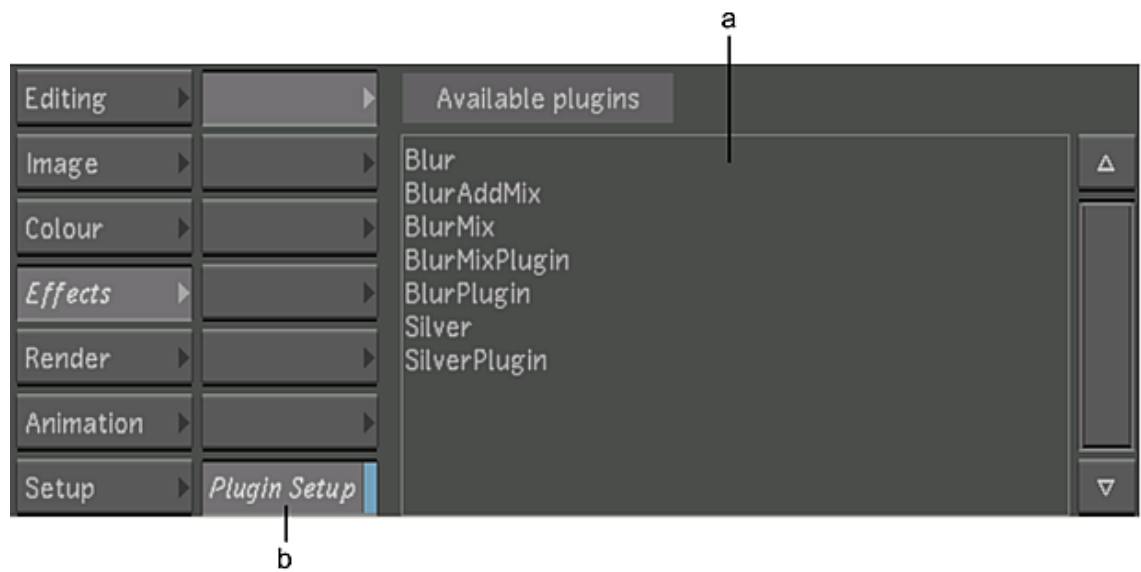
NOTE Adjusting the timing for a folder changes the timing for all channels in that folder.

Animating in Other Menus

keyframes:adding from outside the Animation menu
animations:adding from outside the Animation menu
You can create animations directly in the other menus without having to access the Animation menu. For example, you can change the Grading settings directly in the Colour menu. In the following example, you create an animation using a blur plugin effect.

To create animations in the Effects menu:

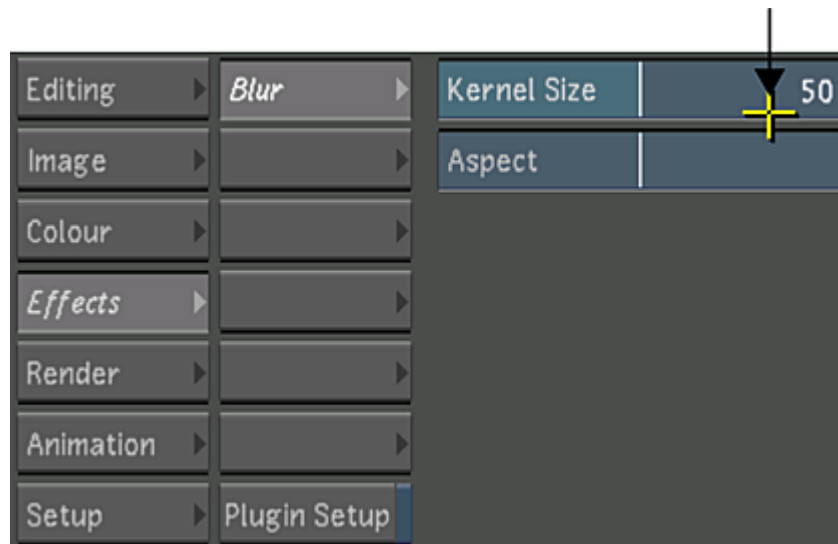
- 1 Select a shot and scrub to the first frame.
Click Effects, and then enable Plugin Setup.



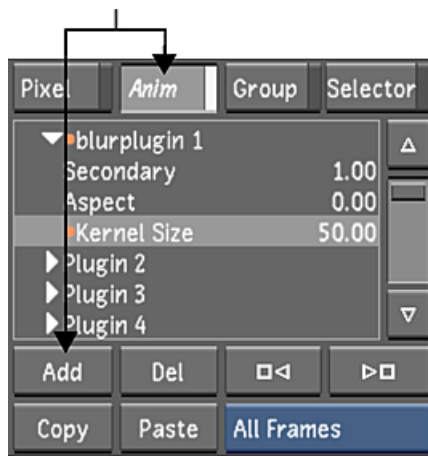
(a) Available plugins list (b) Plugin Setup button

The Available plugins list appears.

- 2 Select Blur from the plugin list, and then set the kernel Size to 50.



- 3 Click Anim, and then click Add.



A keyframe is added at the current frame. When adding keyframes in this way, the interpolation type is always set to Bezier. To change it, you have to use the Interpolation controls in the Animation menu.

- 4 Scrub to the last frame of the shot.
- 5 Set the Kernel Size to 0.
- 6 Click Add again to add another keyframe.
- 7 Scrub through the shot to see the animation.
- 8 To edit the shape of the animation curve, use the tools in the Animation menu. See [Modifying Your Animation](#) (page 557).

Undoing and Redoing Operations

animations:undoing and redoingredoing:in animationundoing:in animationWhen working in the Animation menu, you can undo and redo all operations except the following:

- Canvas pan and zoom changes
- Changes made using the Align options

Stereoscopy

25

The Stereoscopy features of Lustre allow you to grade shots and see them in stereoscopic context. Stereoscopy allows you to take your shots and create the illusion of depth, within the image. In order to create this illusion of depth, you need to present each eye with a slightly different image. This is done by having two sets of footage or conformed timelines; one designated for the left point of view (Left Eye) and the other designated for the right point of view (Right Eye). Once you have one set of footage for the Left and Right Eye, you would use the encoding/decoding scheme to display the image. Encoding is done at the stereoscopic display level by the graphic SDI board and decoding is done by the glasses. This chapter shows you how to enable and use the Stereoscopy features.

Creating a Stereoscopic Project

stereoscopy:creating a projectWhen you create a stereoscopic project, the Left and Right folders are automatically created in the Library for your stereoscopic footage. See [Project Settings](#) (page 63).

It is also possible to enable Stereoscopy from a monoscopic project, in which case you need to do the following:

- Enable the Stereoscopy feature. See [Enabling Stereoscopy](#) (page 577).
- Load your left and right eye footage into your timeline. See [Setting Up the Stereoscopic Footage](#) (page 579).

Enabling Stereoscopy

enabling:stereoscopyActivate the Stereoscopy feature using one of the following methods:

- Enable Stereoscopy in the project settings before entering the Lustre application. See [Project Settings](#) (page 63).
- Enable Stereoscopy while creating a new Flame project. See [Setting Lustre Project Options](#).

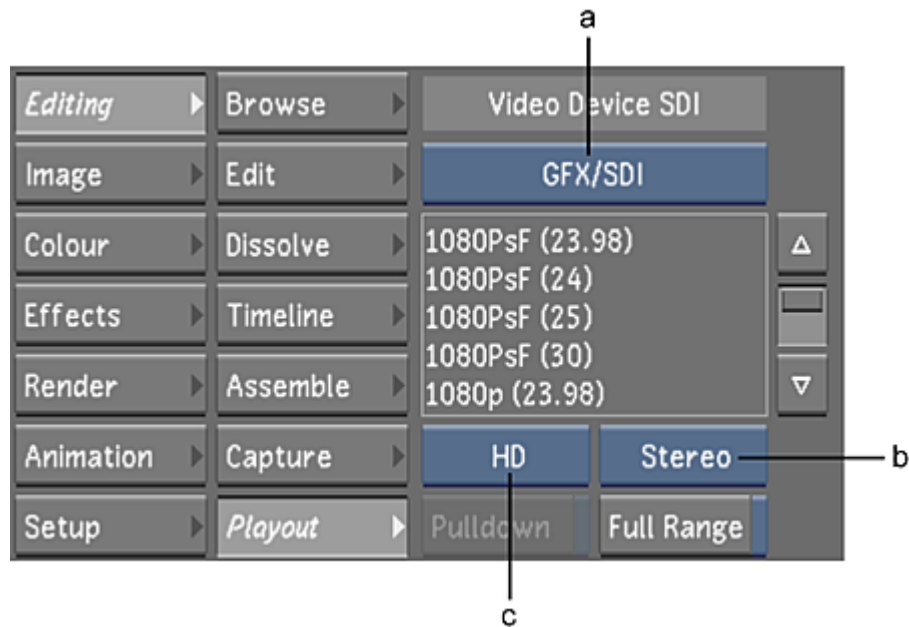
Selecting a Raster for Stereoscopy

selecting:raster for stereoscopy;raster:selecting for stereoscopyYou want to only select a stereoscopic raster if you are connected to a proper stereoscopic device (e.g., Stereoscopy projectors (two projectors or one), or a 3D monitor). When you are playing out your footage to a dual link device, each eye is assigned to one link. The Left Eye always runs through the A Link and the Right Eye through the B Link. Refer to the *Autodesk Lustre Hardware Setup Guide*.

To select a stereoscopic raster:

- 1 Click Editing in the main menu and then click **Playout**.
The **Playout** menu is displayed.
- 2 In the **Video Device SDI** group, toggle the **Video/Graphics Raster** button to display **GFX/SDI**, toggle the format option button to **HD**, toggle the link type button to **Stereo**, and select a **Stereo raster** from the list.

NOTE The **GFX/SDI** raster outputs in 8-bit range when you are working in **Stereo** mode.



(a) **Video/Graphics Raster** button (b) **Link Type** button (c) **Format** button

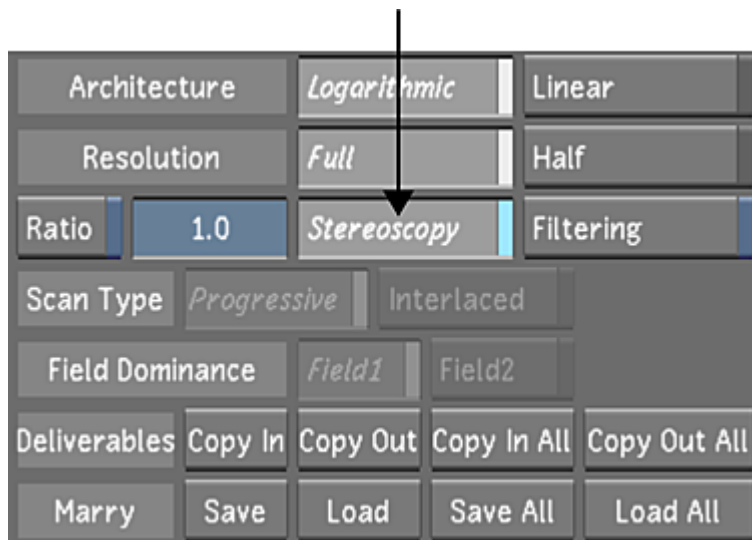
Stereoscopic outputs are now enabled.

Enabling the Stereoscopy Button

You can disable and re-enable the **Stereoscopy** feature by using the **Stereoscopy** button. You would enable the **Stereoscopy** button when you are assembling an **EDL** independently for each eye to create a two-layer timeline. You would then convert it to a **Stereo** timeline.

To enable the Stereoscopy feature:

- 1 Click **Setup** in the main menu and then click **Grade**.
The **Grade** menu is now displayed.
- 2 Enable the **Stereoscopy** button.



The Stereoscopy feature is now enabled.

- 3 (Optional) Click Editing and then click Playback. Within the Playback menu, select a raster from the Video Device SDI group



(a) Raster list

Setting Up the Stereoscopic Footage

loading:stereoscopic footage;stereoscopy:loading footage into timelineOnce you have created a Stereoscopic project, a Library with Left and Right folders, as well as a stereo timeline with a left and right layer is automatically created.

NOTE The stereoscopic timeline is locked as follows:

- The top layer is the left eye.
- The bottom layer is the right eye.

To load the stereoscopic footage to the timeline:

- 1 Drag your stereoscopic footage from the folder location to the Library. See, [Loading Clips to the Library](#) (page 212).
- 2 Select and drop the footage for the Left eye into the Storyboard.
- 3 Click on the L/R button to enable the Right eye.
- 4 Select and drop the footage for the Right eye into the Storyboard.

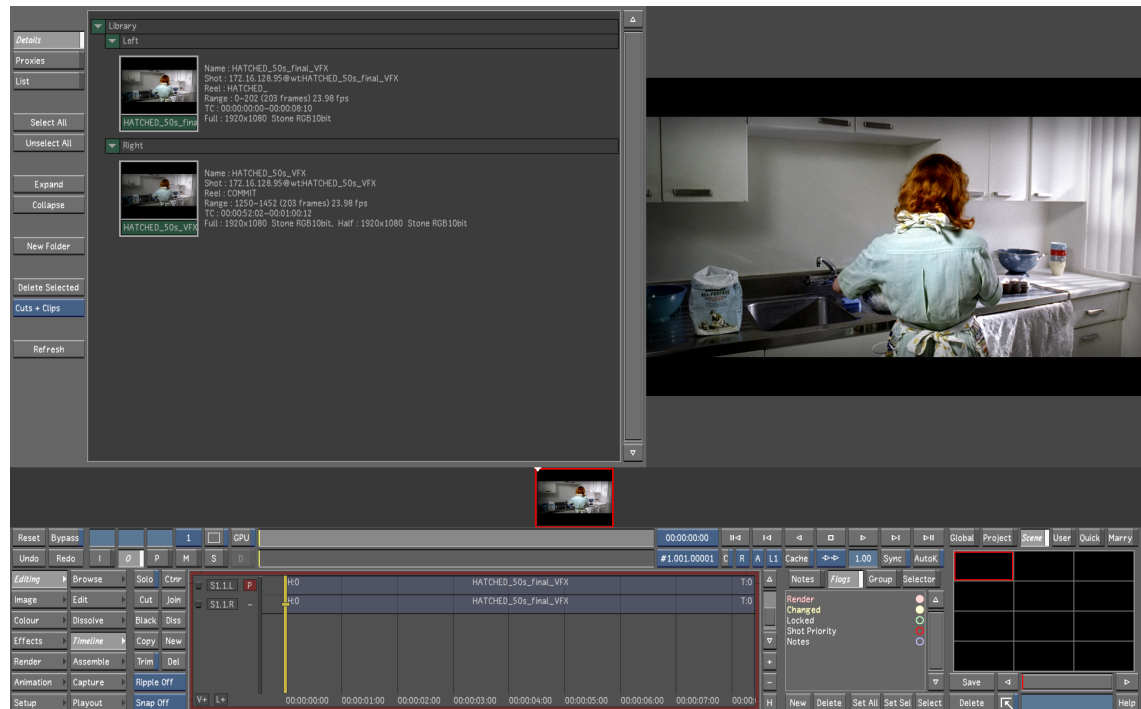


Image courtesy of EVN PRODUCTIONS

- 5 Save the new cut. See [Managing Cuts](#) (page 101).

Assembling a Stereoscopic EDL

stereoscopy:assembling an EDL;assembling stereoscopic EDL files;EDL files;assembling in stereoscopic projectsUse an EDL to rebuild a timeline using the original footage that matches the edited timeline from the offline editing stage of post-production.

To assemble a Stereoscopic EDL:

NOTE This procedure is for every type of media except RED media.

- 1 Import the Left and Right Eye media that you want to assemble into its corresponding Left or Right folder within the Library.
- 2 Click Editing in the Main menu, and then click Assemble.
The Assemble menu is displayed.
- 3 Select the EDL you want to load from the EDL list and then click Load EDL.
- 4 Click Match Media.
- 5 Click Assemble to conform the EDL.
A stereoscopic EDL is created.

To assemble a stereoscopic EDL for RED Stereo workflow:

- 1 Import the Left and Right Eye media that you want to assemble into its corresponding Left or Right folder within the Library.
- 2 Click Setup in the Main menu, and then click Grade.
Make sure the Stereoscopy button is disabled.
- 3 Click Editing in the Main menu, and then click Assemble.
- 4 Select the Right Eye EDL from the EDL list and click Load EDL.
- 5 Within the Library, select the Right Eye folder.
- 6 Enable the Use Selected Folder button.
- 7 Click Match Media and then click Assemble to conform the EDL.
- 8 Enable the To Layer button.
- 9 Repeat steps #4-7 for the Left Eye media.
- 10 Click Setup in the Main menu, and then click Grade.
- 11 Enable the Stereoscopy button and then save the cut.

Repositioning the Left Eye and Right Eye

stereoscopy:repositioning shots Repositioning is fully supported in a stereoscopic project. When Sync mode is enabled, you can reposition both eyes at the same time. (For example, the image in both eyes are offset horizontally by the same amount.)

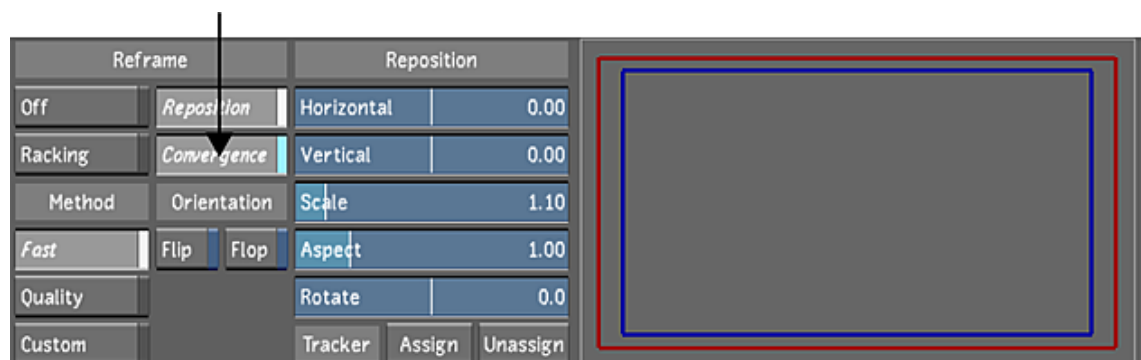
You can also correct convergence discrepancies for the Left Eye and Right Eye by repositioning images at the same time in an equal and opposite manner. (For example, if you scale the image in the Left Eye to 0.80, the image in the Right Eye will be scaled to -1.20.)

You can converge two images using the repositioning options of the Autodesk Control Surface. See [Repositioning Shots](#) (page 838) See the Autodesk Control Surface User Guide.

TIP When converging a shot, select the Blend option in Dual View to overlay the images in the Player. See [Viewing Stereoscopic Footage in Dual View](#) (page 585).

To converge Left Eye and Right Eye images:

- 1 Enable Sync mode. See [Synchronizing the Left and Right Eye](#) (page 586).
- 2 In the timeline, place the positioner over the two shots that you want to converge.
- 3 Display the Reposition menu. See [Accessing the Reposition Menu](#) (page 371).
- 4 Enable Convergence.



NOTE In the Preview window of the Reposition menu, the image reference (i.e., the blue rectangle) is for the assigned eye only.

- 5 Use the Reposition sliders to converge the shots. The other eye will be offset in the equal and opposite manner.

Using the Floating Window

When grading Stereo3D content, it may happen that certain elements of the scene are present in one eye but not the other. When this is the case, you can apply a Floating Window that crops part of Stereo3D content that is only displayed in one eye, preserving the 3D illusion.

TIP When working with the Floating Window, you can display a guide (a green line) on the DVI Display, to mark the position of the Floating Window, by enabling the Show button.

Specifically, the Floating Window tool has two main uses:

- To manipulate the Z-axis position of the 3D scene, without changing the overall depth bracket of the scene.
- To shape and position a floating window to mask out elements in the 3D scene.

The Floating Window is accessed through the Image / Reposition menu. It is displayed by enabling the Floating Win button.

NOTE

- Because the Floating Window affects both eyes simultaneously, the controls are greyed out unless Stereoscopy is enabled, in the Project Settings, and that Sync mode is enabled.
 - You must be viewing the Stereo3D footage on a 3D monitor or on a 2D monitor in Anaglyph mode, in order to view the results of the Floating Window properly.
-

The controls allow you to position the corners of the floating window in Z-space. It also allows one, two or all four corners to be manipulated simultaneously.

There are 3 sets of parameters in the Floating Window menu:

- 1 The first set of controls consists of four numerical sliders labeled Top/Left, Top/Right, Bottom/Left and Bottom/Right.
These controls allow you to "pull in" or "push out" the corresponding corner of the Floating Window. This translates to a black mask being drawn on the edges of the image in the left or the right eye. Depending on whether the slider value is positive or negative, they affect each eye's mask differently. For example:
 - Increasing the value of the Top/Left slider results in the Floating Window's corner being "pushed out" away from the viewer. The mask is applied on the left edge of the right eye in that case.
 - Decreasing the value of the Top/Left slider results in the Floating Window's corner being "pulled in" towards the viewer. When the values are negative, the corner is in theater space (i.e. virtually in front of the monitor) and a black edge becomes visible on the left edge of the left eye.
 - The other controls affect the Floating Window in the same way. Increasing the value of a slider "pushes out" the corresponding corner of the Floating window, whereas decreasing the value results in the corner being "pulled in".
- 2 The second set of controls will affect the Post-Render-Shift (PRS) value, which effectively displaces the whole scene (including the Floating Window) along the Z-axis.

The PRS is implemented as a horizontal translation of one, or both eyes. You can select which eye remains fixed by selecting a value from the Align box. 'Align Left' applies the PRS entirely to the right eye, while Align Right applies it to the left eye and Center applies it to both eyes.

Aux and Offset values are simply additive extensions of the PRS value. For example, if you have PRS=1, Offset=2 and Aux=4, the overall PRS value is 7. You can use Aux and Offset as Presets and enable or disable them using the corresponding Bypass button.

- 3 Lastly the Bypass buttons enable you to bypass specific parameters. The Link buttons allow you to link corners together, making it possible to modify more than a single Floating Window corner with a single slider. And the Reset buttons enable you to reset the values of the top (T), bottom (B), left (L) and right (R) parameters, respectively.

All the slider values can be animated.

Floating Window				Show	
Top / Left		548.80		Top / Right	0.00
Bottom / Left		0.00		Bottom / Right	0.00
PRS	0.00	Aux	0.00	Offset	0.00
Align Left					
Bypass	All	Wndw	Prs	Offs	Aux
Link	T	B	L	R	Reset
	T	B	L	R	

Floating Window

Top/Left field Affects the displacement value of the Top/Left corner of the Floating Window. Increasing the value results in the Floating Windows's Top/Left corner being "pushed out" away from the viewer. Decreasing the value results in the Floating Window's Top/Left corner being "pulled in" towards the viewer.

Bottom/Left field Affects the displacement value of the Bottom/Left corner of the Floating Window. Increasing the value results in the Floating Windows's Bottom/Left corner being "pushed out", away from the viewer. Decreasing the value results in the Floating Window's Bottom/Left corner being "pulled in", towards the viewer.

Top/Right field Affects the displacement value of the Top/Right corner of the Floating Window. Increasing the value results in the Floating Windows's Top/Right corner being "pushed out", away from the viewer. Decreasing the value results in the Floating Window's Top/Top Right corner being "pulled in", towards the viewer.

Bottom/Right field Affects the displacement value of the Bottom/Right corner of the Floating Window. Increasing the value results in the Floating Windows's Bottom/Right corner being "pushed out", away from the viewer. Decreasing the value results in the Floating Window's Bottom/Right corner being "pulled in", towards the viewer.

Post-Render Shift

PRS field Affects the horizontal translation offset value applied between the two shots in the scene. This parameter is relative to the setting if the Alignment box.

Offset field Affects the horizontal translation offset value applied between the two shots in the scene. This parameter is relative to the setting if the Alignment box.

Aux field Affects the horizontal translation offset value applied between the two shots in the scene. This parameter is relative to the setting if the Alignment box.

NOTE These three fields are additive. The offset applied to the scene is the sum of the values of these three fields.

Bypass

All button Bypasses all Floating Window parameters.

Window button Bypasses the corner parameters of the Floating Window (Top/Left, Bottom/Left, Top/Right, Bottom/Right).

Prs button Bypasses the PRS parameter of the Floating Window.

Offs button Bypasses the Offset parameter of the Floating Window.

Aux button Bypasses the Aux parameter of the Floating Window.

Link

T button Link the Top/Left and Top/Right parameters. When enabled, moving one slider affects both values.

B button Link the Bottom/Left and Bottom/Right parameters. When enabled, moving one slider affects both values.

L button Link the Top/Left and Bottom/Left parameters. When enabled, moving one slider affects both values.

R button Link the Top/Right and Bottom/Right parameters. When enabled, moving one slider affects both values.

Reset

T button Reset the Top/Left and Top/Right parameters. The button resets both values regardless of whether they are linked or not.

B button Reset the Bottom/Left and Bottom/Right parameters. The button resets both values regardless of whether they are linked or not.

L button Reset the Top/Left and Bottom/Left parameters. The button resets both values regardless of whether they are linked or not.

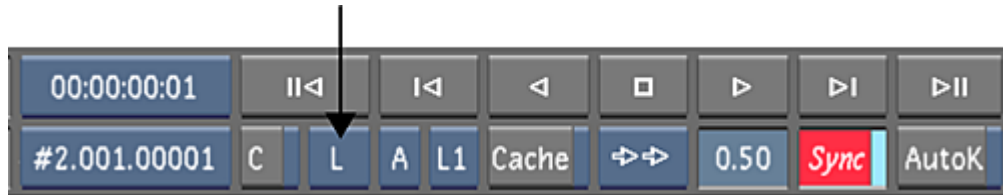
R button Reset the Top/Right and Bottom/Right parameters. The button resets both values regardless of whether they are linked or not.

Viewing From One Eye to the Other

stereoscopy:viewing an eye;viewing:stereoscopic footageAs you are grading your Left and Right Eye footage, there is an easy way for you to switch the footage that is being displayed in the Player. The Left and Right Eye button allows you to switch between the footage with ease.

To switch the footage displayed in the Player from one eye to the other:

- 1 Do one of the following:
 - In the Player display controls, click on the Left/Right Eye (L/R) button.



NOTE This is the field 1 (F1)/field 2 (F2) button when you are not in Stereo mode. You can still check your field dominance when in Stereo mode by holding the Ctrl key and clicking on the Field 1/Field 2 buttons in the Setup/Grade menu.

- Press ; (semicolon).

If you are currently displaying the Right Eye timeline in the Player, the layer output selector is labelled R. When you click the R button, the layer output selector is now labelled L, the Left Eye is displayed in the Player, and the focus point is now on the Left Eye layer (and vice versa).

Switching the Player to display the Left or Right Eye footage does not affect what is playing out on the NVIDIA HDSI output if you have selected a stereoscopic raster. If you have selected a mono (non-Stereo) raster, the layer (eye) you see on your monitor is what is displayed on your video output.

NOTE The position of the focus point is linked to the layer output selector.

Viewing Stereoscopic Footage in Dual View

Dual view:in a stereoscopic projectOnce a stereoscopic project is enabled, you can display each eye at the current frame at the same time in Dual View mode. As in A/B mode, you can view the images side by side (2-up mode), or a portion of each image in the same viewer (Vertical Wipe and Horizontal Wipe modes).

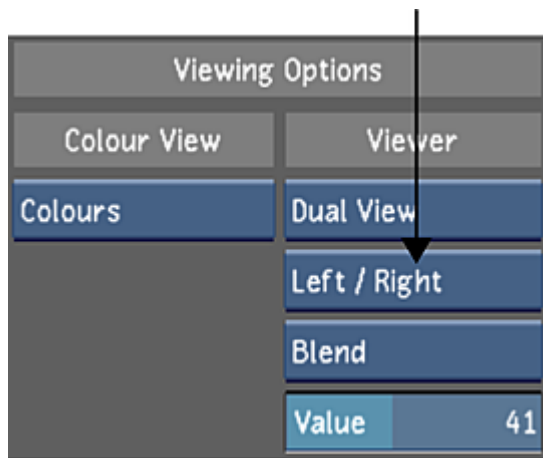
In a stereoscopic project, you can also view the Left Eye overlaid on the Right Eye, as a blended image.

To display the Dual View Blend mode:

- 1 Display the dual viewer. See [Using Dual View](#) (page 334).



- 2 In the Dual View Display option box, select Left/Right.



- 3 Do one of the following:
 - Select Blend.
 - Press **Ctrl+F4** to cycle through display options until Blend is displayed.
 The viewer displays the image of the Right Eye overlaid over the Left Eye.



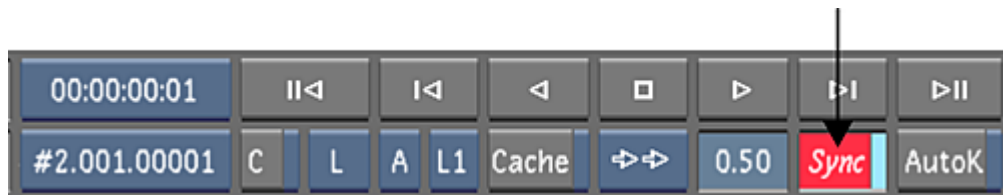
- 4 Set the Value slider to determine the percentage of opacity of the image in the Left Eye.

Synchronizing the Left and Right Eye

synchronizing eyes in a stereoscopic project Since the Player only displays either the Left Eye or Right Eye, it is difficult and tedious to edit and grade one eye and create the same changes for the other eye. An easy way for you to make sure any editing or grading is automatically applied from one eye to the other is by using the Sync option. When this feature is enabled, any editing or grading you do on one eye is applied to the other.

To apply the editing and grading from one eye to the other:

- 1 From the Player display controls, click Sync.



Now all editing and grading operations on one eye will be duplicated on the other.

The Sync option only works if you do not break the sync. For example, if you enable Sync and draw a geometry, whatever you do to that geometry on one eye will be duplicated on the other. The moment you disable the Sync option and change the geometry on one eye (e.g., colour, position, vertex, etc.), that geometry will never be synced again when you re-enable Sync.

NOTE If you only break sync with the colour grading, the rest of the geometry (i.e., position, vertex, etc.) will still be in sync once you re-enable the Sync option.

When you re-enable Sync mode, the grading data that was applied separately on each eye will be retained on each eye. Re-enabling Sync mode will not copy the grading back to the other eye.

Editing the Stereoscopic Timeline

editing:in a stereoscopic project;stereoscopy:editingWhen the Sync button is enabled, all editorial operations (Cut, Trim, Copy, Delete, add a Dissolve, add black frames, Solo, etc.) and all structural operations (add a Track/Layer, add a Container, Collapse) are supported when working on stereoscopic timelines.

NOTE The sync button affects only the editorial operations. Structural operations are always performed in sync.

See [Synchronizing the Left and Right Eye](#) (page 586).

Stereoscopy and Matte Containers/Multi-Channel Clips

When working in a stereoscopic project, entering the matte container or multi-channel segment shows both left and right eye content.

See [Adding a Matte to a Matte Container](#) (page 291).

Swapping Left and Right Shots

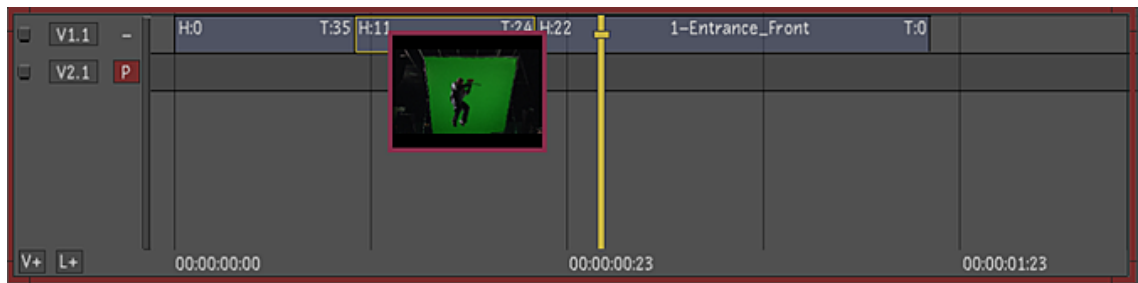
Use the hotkeys ALT+L and ALT+R to swap all shots from one stereo eye to the other on the current layer. The layer indicator will not change location. It is also possible to swap shots on all layers of the primary video track with hotkeys CTRL+ALT+L and CTRL+ALT+R.

Replacing Shots in a Stereo Timeline

When working on a Stereoscopic project, you can perform a shot replace that applies to both eyes at the same time.

NOTE In Stereo, you must replace the shot for both eyes. It is not possible to use Replace Shot for only one eye.

- 1 Load the Timeline you want to modify.
- 2 In the Library, hold SHIFT key and select the Left clip. A "L" icon appears on the top right side of the thumbnail.
- 3 Navigate the Library to find the Right clip, hold SHIFT key and select the Right clip. A "R" icon appears on the thumbnail. Release SHIFT key.
- 4 Move the selection over the Storyboard or Timeline segment you want to replace and click on the thumbnail.



Both Left and Right shots have been replaced with the selection and the grading on the original shots is preserved.

Grading Stereoscopic Footage

colour grading:in a stereoscopic project;**stereoscopy:**gradingWhen Sync mode is enabled, grading operations (including dragging and dropping) are applied to the respective destination eye. For example, grading data dragged from a Right Eye layer is always applied to a Right Eye destination layer, even if it is dropped on the Left Eye. See [Synchronizing the Left and Right Eye](#) (page 586).

Shots can still be graded separately when Sync mode is disabled. After grading one eye, grading data can be copied to the other eye. See [Copying Elements](#) (page 285). Separate grading can also be used to differentiate the grades on each eye.

During secondary colour grading, you can copy different grading data for each eye at the same time from one secondary layer to another, and the grading data for each eye that was applied when Sync mode was disabled will be copied to appropriate eyes.

Working with Grade Files

grades:in a stereoscopic project;**stereoscopy:**grade filesIn a stereoscopic project, grade files contain data for both the Left Eye and Right Eye.

In the Grade bin, each storage container can include Left Eye and Right Eye grading data. The thumbnail of the grade corresponds to the currently assigned eye. In the Grade view, the expanded Grade bin and its player demonstrate the same behaviour. See [Using Grade Bins](#) (page 151) and [Using the Expanded Grade Bin](#) (page 159).

Disable Sync mode to apply data from a grade file to only the assigned eye: only the grade data for the current eye will be applied. When Sync mode is on, data from a grade file is applied to both eyes: if the grades are different for each eye, each grade is applied to the appropriate eye. See [Synchronizing the Left and Right Eye](#) (page 586).

Bypassing Menu Parameters of an Eye

bypassing:menu parameters, in a stereoscopic project;**stereoscopy:**bypassing menu parametersYou can use the Bypass button to view the original shot of one eye or both eyes. See [Bypassing Menu Parameters](#) (page 134).

Bypass results depend on the state of the Sync mode. See [Synchronizing the Left and Right Eye](#) (page 586).

Set:	To:
Sync mode on	Display the original state of shots on the Left and Right Eye.
Sync mode off	Display the original state of shots on the assigned eye.

Rendering Stereoscopic Footage

rendering:in a stereoscopic project;stereoscopy:renderingThe procedure for rendering your stereoscopic footage is the same as for rendering normal shots (i.e., mono mode). See [Rendering Shots](#) (page 591).

The differences in rendering stereoscopic shots are as follows:

- The shots are rendered out to the folder you specified when creating your project (see [Project Settings](#) (page 63)), but the Left and Right Eye footage is separated into two folders labelled 'Left' and 'Right'.
- You have to render both Left and Right Eye shots together. You cannot render each eye individually.

Once the shots have been rendered, Stereoscopy must be enabled in order for you to view your rendered footage in print (P) mode.

Rendering

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rendering:overviewRender individual shots, layer(s) in the timeline, or complete scenes in Lustre to create a new version of the footage with all colour grading, animation, repositioning, and dust removal data applied. Rendering is necessary for output and viewing both frames of interlaced footage at the same time. Furthermore, rendering 2K material with effects applied allows you to view your work in real-time.

WARNING

Due to the enhancements in the GPU, we do not recommend using Lustre to render grades created in Lustre 2011 or earlier if you are looking for pixel accuracy rendering.

You can render anytime during a colour grading project. For example, you might want to render an interim version part way through a project to show to a client, in addition to rendering the final version. Lustre has several options to make this easier—you can render full- or half-resolution versions of the grade, apply an output LUT, and render to a number of different file formats, regardless of the format of the original.

There are also several methods available for rendering your scenes—using the Lustre Render menus, or using Autodesk Burn® for Lustre to take advantage of the processing power of other machines. You can also use Lustre ShotReactor to render shots as you work on the grade.

In Lustre, there are two methods available for viewing rendered versions. To view any shot that has been rendered to disk, use Print view mode. See [Setting the View Mode](#) (page 320). To quickly render a temporary version for playback, use memory caching. Frames are rendered and cached to your computer's memory and then made available for playback. See [Caching Frames to Memory for Real-Time Playback](#) (page 344).

For increased speed of interaction on unrendered footage throughout the course of a project, you can opt to work on 1K proxies of the original footage.

Rendering Shots

shots:renderingrendering:shotsYou can use the Render menus to render your work. You can render selected shots, all shots in a cut, a specific layer in the multi-layer timeline, or the flattened result of a multi-layer timeline. To prepare for rendering, do the following:

- Specify the shots to render.
- Specify the layer to render.
- Set the resolution of the render files.
- Set resize options as needed.
- Specify the destination for the render files.
- Specify the output file format.

- Specify the file density (logarithmic or linear).
- (Optional) Change the output colour space or specify an output LUT.
- Set other options such as timecode burn-in and rendering with a viewing LUT.

Specifying the Shots to Render

rendering:region, specifyingflagging shots:for renderingflagging shots:automaticallyrendering:flagging shots automaticallyRenders are done on a shot-by-shot basis—you can render one shot, several selected shots, or all shots in a scene. To specify a shot for rendering, you flag it. You can flag shots manually or have Lustre automatically flag any shot to which changes have been applied. By default, all shots are automatically flagged for rendering.

A file containing rendering information is created and stored in the Library directory found under each scene directory. This file contains a line for each shot that includes the shot path and name and the number 0 or 1, which indicates if a render flag is set for the shot (1) or not (0). These files are named <grade name>.render and are updated each time the grade is saved. Other applications, such as the command line renderer or scripts, can read or bypass this file setting.

If you are rendering a multi-layer timeline and Solo and Mute mode are disabled, only the flagged shots in the flattened timeline will be rendered. If you are rendering a multi-layer timeline and Solo or Mute mode is enabled, only the flagged shots in the active layer(s) will be rendered.

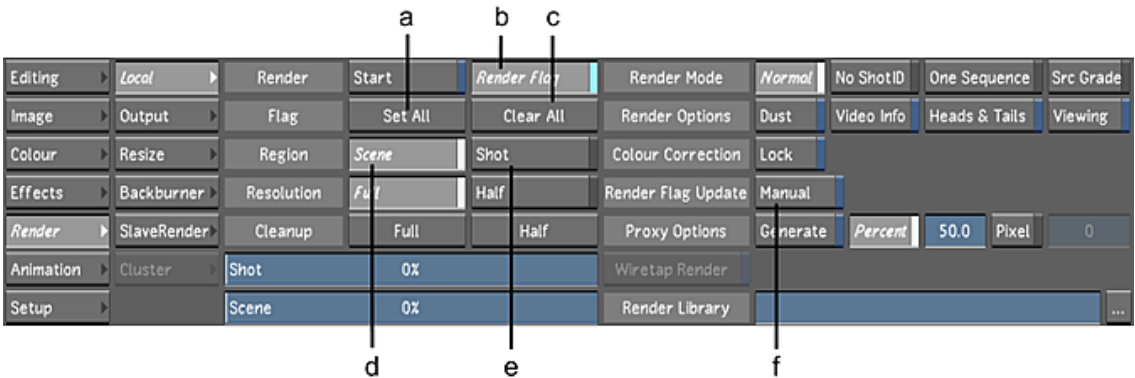
A shot that is flagged for rendering is identified by a red square in the upper-left corner of the screen.



To flag shots, use the Render Local menu.

To access the Render Local menu:

- 1 In the Main menu, click Render, and then click Local.
The Render Local menu appears.



(a) Set All button (b) Render Flag button(c) Clear All button (d) Render Scene button (e) Render Shot button (f) Render Flag Update button

NOTE If using the Linux version of Lustre, the Cluster menu will be part of the Render menu. This is for use with Lustre on an Incinerator high-speed network. If applicable, refer to your *Autodesk Incinerator Installation and User Guide*.

rendering:flagging single shots manuallyflagging shots:manuallyrendering:flagging single shots manuallyflagging shots:manually

To manually flag one shot:

- 1 Navigate to any frame in the shot.
- 2 Enable Render Flag.

To manually flag all shots in the cut:

- 1 Click Set All.

The render flag is set for all shots in the cut and the Render Flag button is enabled.

To manually clear one flag:

- 1 Navigate to the shot.
- 2 Disable Render Flag.

To clear all render flags:

- 1 Click Clear All.

NOTE Render flags are not automatically cleared after rendering.

To flag shots automatically:

- 1 Enable Render Flag Update.

Shots will be flagged for render immediately after any grading or other effect has been applied.

After you set your render flags, you can still choose to render just the current flagged shot or all flagged shots in the timeline.

To set the shots to be rendered:

- 1 Do one of the following:
 - Enable Scene to render all flagged shots in the cut.
 - Enable Shot to render the current flagged shot.

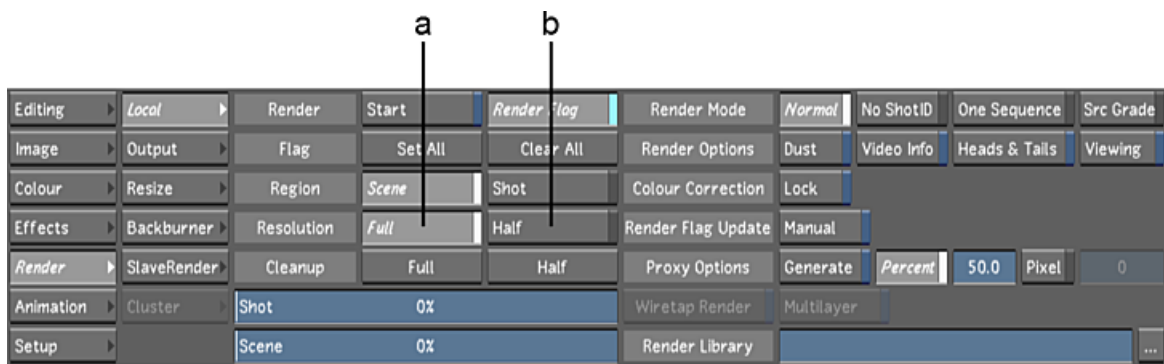
NOTE In both cases, rendering starts from the current frame and continues forward.

Setting the Resolution for the Render

resolution:renderingresolution, settingYou can render your original shots at full resolution, which is the same resolution as the original footage, or at half resolution. You can also render resized shots at either full or half resolution. If you use half-resolution scans as the source, they can affect the quality of the output but are usually faster to process. You may opt to do this if you want a quick, intermediate render as opposed to a final quality render.

To set the resolution, use the controls directly below the image window.

NOTE The resolution parameter in the Render Local menu is the same as that found in the Grade menu and in the user interface controls directly below the image window.



(a) Full Resolution button (b) Half Resolution button

To set the output resolution for full- or half-resolution output:

- 1 Specify the output resolution you want to use by enabling the Full Resolution or Half Resolution toggle, below the Viewport.

To set the output resolution to a video format:

- 1 Specify the source resolution you want to use for your render files by enabling the Full Resolution or Half Resolution toggle, below the Viewport.
- 2 Select a video format in the Render Resize menu. See [Resizing Shots](#) (page 594).

Resizing Shots

Resize shots prior to rendering them to conform to a different destination output format. For example, if you plan on playing out a cut to a video format, use the controls in the Resize menu to select the appropriate video format and then render the cut at that format to use as the version you play out to a VTR. After you have selected the output format, you can set crop and resize options to control how the image fits into the new format.

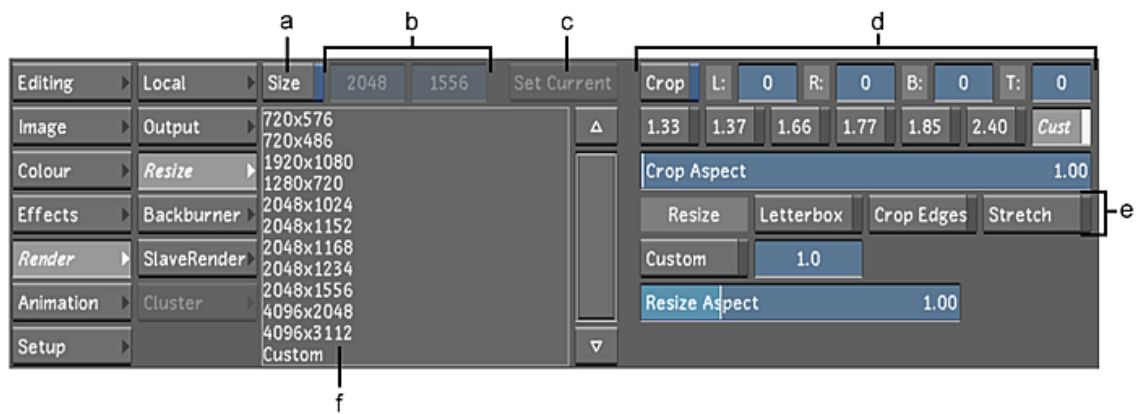
NOTE Support for resizing depends on the version of the graphics card installed on your system. See your release notes for details.

Resize data is saved with the grade in a Resize preset file that uses the grade name.

When you resize shots using the Resize menu, all shots in the timeline are resized. To resize individual shots, use the tools in the Reposition menu. See [Repositioning an Image](#) (page 372).

To resize shots:

- 1 Load the grade linked to the cut containing the shots you want to resize. See [Loading Grades for a Cut](#) (page 106).
- 2 Click Render and then click Resize.
The Resize menu appears.



(a) Size button (b) Custom Width and Height fields (c) Set Current button (d) Crop options (e) Resize options (f) Video and film format list

- 3 To resize to a new format, such as a video format, enable Size, and then select a format from the list. If you select Custom, you can enter a width and height in the Width and Height fields, or click Set Current to set the format to the current frame size.

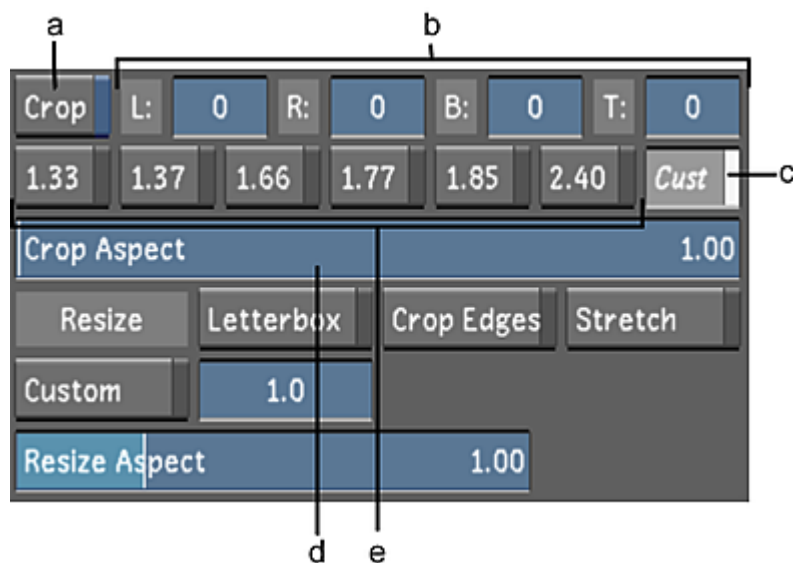
If the selected format is larger than the original image size, by default a black border appears around the image, showing the final output size. If the selected format is smaller than the original image size, the image is cropped, showing the final output size.

NOTE You can check the resolution of the original scans in the Library, accessible from the Editing Browse menu. Source resolution is important for quality resizing. For example, you obtain a better quality HD output with 2K full scan sources than with 1K half scan sources.

- 4 Select a Resize option to specify how the image will fit into the specified format.

Select:	To:
Letterbox	Fit the entire image into the specified output format. Vertical or horizontal black borders accommodate any difference in the aspect ratio of the original image and final output format.
Crop Edges	Fill the new format size with the image, cropping the edges of the original image as needed to accommodate differences in the aspect ratio of the original image and final output format.
Stretch	Stretch the original image to fit the specified output format. If the aspect ratio of the original image and final output format is different, the image is distorted.

- 5 Set the crop size. Enable Crop and then do one of the following:
 - Enter custom crop values in the Left, Right, Bottom, and Top fields.
 - Enable one of the standard Crop Preset buttons.
 - Enable Cust and then use the Crop Aspect slider to set the aspect ratio of the crop.



(a) Crop button (b) Left, Right, Bottom, and Top fields (c) Cust (Custom) button (d) Crop Aspect slider (e) Crop Preset buttons

NOTE Cropping in Lustre affects both output resolution and how the source file is read. For example, if you crop a 2K (2048x1556) scan to 1:85, the render size becomes 2048x1107. Lustre also reads the scan more quickly since there are fewer lines of pixels to go through.

- 6 To proportionally scale the image, enable Cust and then enter a scaling value in the Cust field.
- 7 If needed, you can squeeze or stretch the image horizontally using the Resize Aspect slider.
The Resize Aspect value you set is displayed in the field to the right of the slider.

Specifying the Destination for Local Render Files

The render files are saved in the location specified in the Renders Full Home or Renders Half Home, in the Project Settings. The sub-folders are named according to the render mode used, (i.e. Normal, One Sequence, etc.), which Lustre automatically creates when you render your first shots.

You can use the default path structure defined in the RenderNaming section of the init.config file. Or you can customize your renders by modifying the fields in the Render Naming menu, in the Project settings.

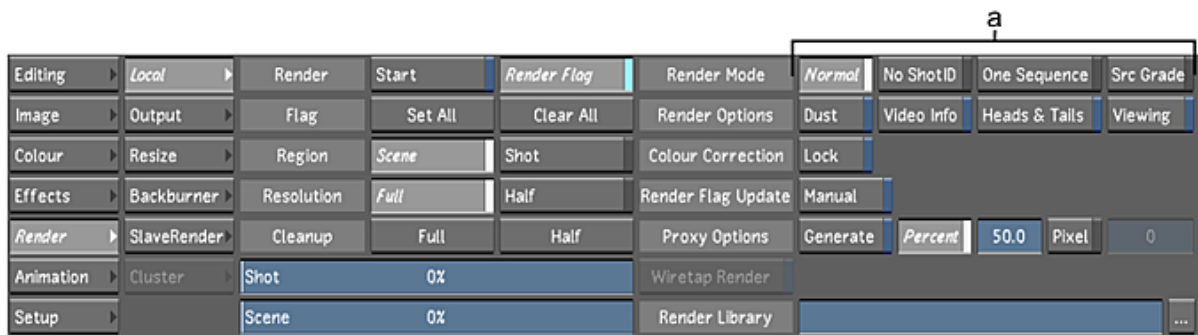
See

[Recommended Directory Structure for Projects](#) (page 59).

[Render Naming Settings](#) (page 72)

NOTE Dust removal render files created using the Rendering controls in the Dust menu are not saved with the rendered files. See [Rendering the Result](#) (page 356).

You can specify how you want render files to be organized using the Render Place controls in the Render Local menu.



(a) Render Place controls

These controls affect the naming scheme of the render files, the location where they are saved, and the way that multiple instances of the same shot in the timeline are saved. For example, when Normal is selected, Lustre saves all the render files of each given shot to an individual folder based on the original filename and grade.

To set how render files are organized:

NOTE The following explains the render modes when using the DEFAULT render naming structure.

- 1 Enable Normal, No ShotID, One Sequence, or Src Grade.

Normal Individually graded shots are rendered to a folder called "Normal", in the Renders Home location and the UID is included in the filename.

Default render structure for Normal mode (ignore any line breaks):

```
[RENDERS_HOME]/Normal/[SCENE]/[GRADE_NAME]/[REEL_NAME]/
[RESOLUTION]/[UID]_[ORIGINAL_FILENAME]_[GRADE_NAME]
```

Black frames are rendered out to a separate folder in the Renders Home location.

No ShotID Individually graded shots are rendered to a folder called "NoShotID", in the Renders Home location.

Default render structure for No ShotID (ignore any line breaks):

```
[RENDERS_HOME]/NoShotID/[SCENE]/[GRADE_NAME]/[REEL_NAME]/
[RESOLUTION]/[ORIGINAL_FILENAME]_[GRADE_NAME]
```

Black frames are rendered to a separate folder in the Renders Home location.

One Sequence Individually graded shots are rendered as a single sequence in the Renders Home location. Black frames are rendered to the same single sequence in the same scene folder.

Default render structure for One seq mode (ignore any line breaks):

```
[RENDERS_HOME]/OneSequence/[SCENE]/[GRADE_NAME]/[RESOLUTION]
```

Src Grade

Individually graded shots are rendered to a folder called "SrcGrade" in the Renders Home location and UID is included in the filename.

When used locally, this render mode bypasses dissolve transitions and retime parameters. Dissolves become hard cuts and retimes are rendered with a default value of 100%.

This render mode is also used in Interoperability workflows. When rendering with a Wiretap path, Src Grade will retain transition effects and Timeline FX.

Black frames are rendered to a separate folder in the Renders Home location.

Rendering the Multi-Layer Timeline

Lustre renders out what is displayed in the multi-layer timeline and Player, according to:

- Top vertical priority
- The presence or absence of priority shots and muted layers
- The Solo status

If Solo mode is disabled, Lustre renders the topmost layer by default. If there are gaps, Lustre takes into account top vertical priority behaviour and render out all the shots from the lower layers that are visible through the transparent gaps that are above.

If you do not want a shot in a lower layer to be rendered that is located beneath a gap, you can replace the gap with a virtual black clip. See [Adding a Virtual Black Clip using the Storyboard](#) (page 276) and [Adding Black Media to the Timeline](#) (page 286).

If you wish to render out the shots on a specific layer, you either must Solo the active layer, or Mute the unwanted layers. If there are gaps in this layer, the gaps are skipped by the rendering process .

If you wish to render out a shot that normally would not be rendered because top vertical priority renders out a shot on a different layer, you can use the shot priority function to prioritize this shot.

For more information, refer to the following links:

- [Top Vertical Priority](#) (page 304)
- [Muted Layers](#) (page 305)
- [Shot Priority](#) (page 305)
- [Solo Mode](#) (page 309)

Rendering the Multi-Layer Timeline with Normal

When the Normal button is selected, Solo mode is disabled, and there are no muted layers, Lustre interprets gaps as being transparent and flattens layers in a top-down manner. Lustre renders out what is visible in the multi-layer timeline in accordance with top vertical priority. The individually graded shots with frames that are visible are rendered and saved to their own folder in the Renders Home location. If there are no shots beneath the gap, the rendering process skips the gap.

You can render one specified layer at a time by muting unwanted layers or soloing a desired layer. Lustre renders individually graded shots with frames that are visible as individual shots and saves them to their own UID directories in the Renders Home location.

Rendering the Multi-Layer Timeline with No ShotID

Renders the same way as Normal mode. However, when rendering with No ShotID, you can render one layer only for each grade. Consequently, when rendering out L1 first, then rendering out L2 within the same grade, the L2 render overwrites the previous L1 render files.

To render out L2 without overwriting the previous L1 render, you can do one of the following:

- Save a new grade (i.e., grd02).
- Use Normal render mode.
- Add a UID token in the filename. See [Render Naming Settings](#)

Rendering the Multi-Layer Timeline with One Sequence

When the One Sequence button is selected, Solo mode is disabled, and there are no muted layers, by default Lustre sees the gaps as transparent and flattens the layers in a top-down manner. Lustre renders out what is visible in the multi-layer timeline in accordance with top vertical priority. Lustre renders the individually

graded shots with frames that are visible to the scene folder as a single sequence in the Renders Home location. If there are no shots beneath the gap, the gap is rendered as black to the same single sequence in the same scene folder.

When the One Sequence button is selected, you can render one specified layer at a time by soloing the desired layer or muting the unwanted layers. Lustre renders the individually graded shots with frames that are visible to the scene folder as a single sequence in the Renders Home location. Gaps are rendered as black to the same single sequence in the same scene folder.

NOTE When rendering with One Sequence, you can render one layer only for each grade. That is, if you render out L1 first, and then within the same grade renders out L2, the L2 render will overwrite the previous L1 render files. To render out L2 without overwriting the previous L1 render, you must save a new grade (grd02).

Rendering the Multi-Layer Timeline with Src Grade

Src Grade works just like Normal render in that it renders each shot to its own folder under the SrcGrade directory and the rendering process will skip gaps if there are no shots beneath them. When this option is enabled, the rendering process bypasses any dissolve transitions and retime parameters. In other words, dissolves become hard cuts and retimes are rendered with a default of 100% value.

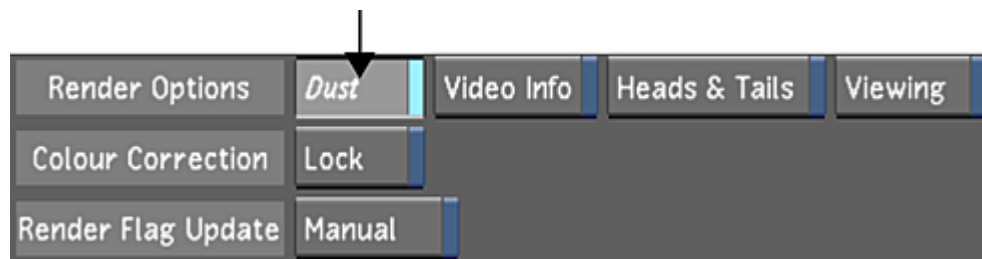
Rendering Dust Metadata

dust removal:renderingrendering:dust removal dataYou can render shots with or without dust metadata. This is a workflow decision. You can render dust metadata either from the Render Local menu or from the Image Dust menu. See [Rendering the Result](#) (page 356).

To render shots with dust metadata, you must first use the dust removal tools to remove dust artefacts. See [Removing Dust](#) (page 347).

To render shots with or without dust metadata:

- 1 In the Render Local menu, do one of the following:
 - To render shots without dust metadata, disable Dust.
 - To render shots with dust metadata, enable Dust.

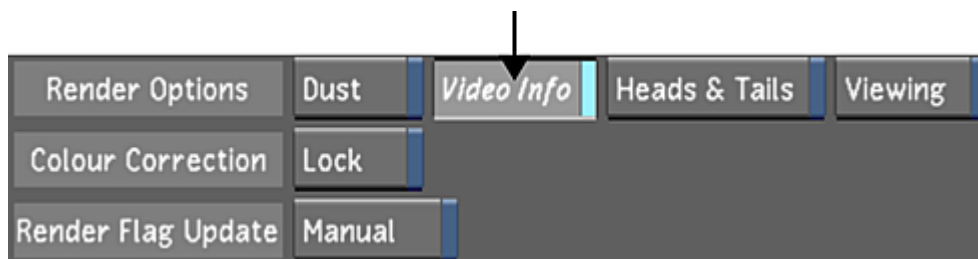


Burning Timecode into the Render

timecode:burning into render filesrendering:burning in timecodeYou have the option of burning the timecode into the render files. For example, burn a timecode into the black border of a letterboxed shot to identify the location of the shot.

To set timecode burn-in:

- 1 In the Render Local menu, enable Video Info.



Rendering with the Viewing LUT

viewing LUTs:rendering withrendering:with viewing LUTsFor linear work, you can render shots to 8-bit BMP files using the currently loaded viewing LUT with the Viewing option. Use this option when you want to render the image displayed in the monitor.

When this option is enabled, the output consists of exactly what you see on the monitor, namely, the image resulting from the applied monitor calibration setting, viewing LUT, and colour space settings applied in the Render Output menu.

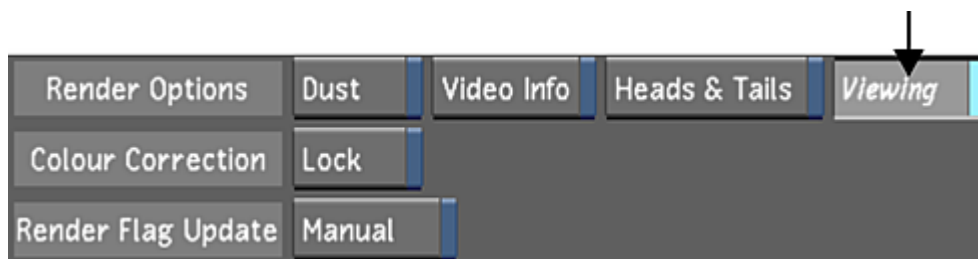
When this option is disabled, the currently applied viewing LUT is not taken into account in the output image, and the files are rendered to the file format specified in the Render Output menu rather than to 8-bit BMP files.

For information on monitor calibration, see [Calibrating a Monitor](#) (page 184). For information on output colour space settings, see [Setting Colour Space Options](#) (page 602).

NOTE You can also render shots to DPX files with a viewing LUT applied. This is performed in the Render Output menu. See [Setting Colour Space Options](#) (page 602).

To set rendering with the viewing LUT:

- 1 In the Render Local menu, enable Viewing.



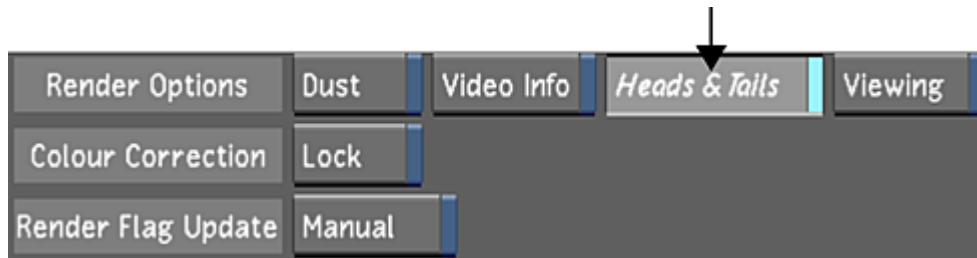
Rendering Head and Tail Frames

tail frames, renderinghead frames, renderingrendering:head and tail framesWhen rendering shots or timelines, you can render the grade on the head and tail frames. This can be useful if, for example, the graded shot needs to be changed to include a longer dissolve and requires additional frames.

NOTE Rendering the head and tail frames is only applicable to the Normal, No ShotID, and Src Grade rendering options.

To render shots with head and tail frames:

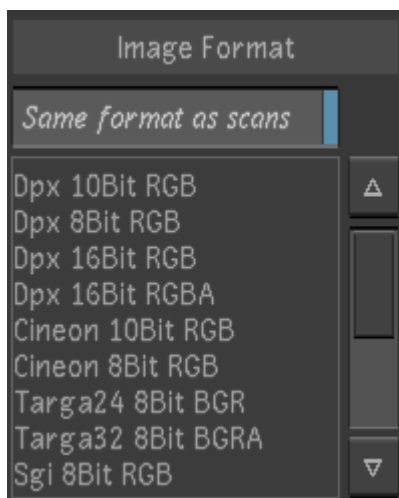
- 1 In the Render Local menu, enable Heads & Tails.



Specifying the Output Format of the Render Files

format, setting the output for render filesrendering:output format, specifyingBy default, shots are rendered to the same format as the original footage. They can optionally be rendered to:

- DPX at 10b RGB, 8b RGB, 16bRGB, 16bRGBA
- Cineon at 10 and 8 bit RGB
- TIFF at 8 and 16 bits per channel, RGB and RGBA
- TARGA24 8b BGR
- TARGA32 8b BGRA
- Sgi at 8b RGB and 8b RGBA
- BMP 8b RGBA
- RGB OpenEXR 16-bit half float. If you output to this floating-point format, the float conversion LUT is applied to the output buffer for display. See [Calibration Settings](#) (page 65).



The Image Format dialog

To specify the output format:

- 1 From the menu, choose Render > Output to access the Image Format menu.
- 2 Do one of the following:
 - To render to the same format as the originals, enable Same format as scans. This option is disabled if the colour transform selected in Render > Output converts from floating point to integer values.

This is to avoid the potential confusion that could be caused if the input scans are OpenEXR, in which case the float conversion LUT (fclut) would be applied in the viewport as usual for floating-point inputs.

- To render to another format, disable Same format as scans and select an output format from the list.

Setting Colour Space Options

rendering:colour space, settingcolour space:renderingYou can convert the colour space of the output shots from Log to Lin or vice versa. Whether you are outputting in Log or Lin colour space, you have several options for setting a LUT or colour transform used on output. You can:

- Use the default colour mapping. The default mapping differs according to the grading architecture used on the project (as set in the Grade menu).

Grading Architecture	Output Colour Space	Colour Mapping Applied
Log	Log	None
Log	Lin	Standard log-to-lin (95-685)
Lin	Lin	None
Lin	Log	Standard lin-to-log (95-885)

- Select an output LUT or colour transform.

The output colour space and colour mapping affect the image you see on the monitor. These settings are saved in the output buffer, which is applied to the output on the monitor before the viewing LUT and *monitor.calib* correction (if used) are applied.

Specifying the Output Colour Space

Using the Default Colour Mapping

- 1 Access the Render / Output menu.
- 2 From the Colour Space box, select either Logarithmic or Linear.
You are set up to use the default colour mapping.

Using a LUT or Colour Transform

- 1 Access the Render / Output menu.
- 2 From the LUT Type box, select 1D Lut, 3D Lut or Colour Transform.
- 3 Click Enable.
- 4 Select an item from the list, or click the Browse (...) button to locate and select a different LUT or colour transform.
- 5 Click the Enable LUT button.
The selected LUT will be applied to your render.

To create a custom colour transform, see [Creating a Custom Colour Transform](#) (page 226).

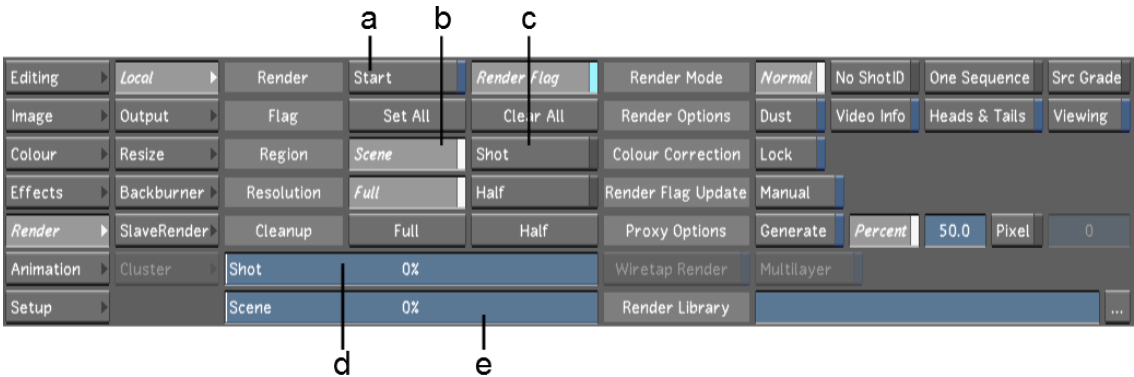
NOTE If you apply a colour transform that has floating-point inputs, the inverse float-conversion LUT is applied automatically first. See [Calibration Settings](#) (page 65).

Rendering the Selected Region

regions, rendering selectedrendering:selected regionOnce you have set all the rendering options, you can render flagged shots within a scene region using the Render Local menu, or just render one shot at a time by enabling the shot region.

To render the selected region:

- 1 Access the Render Local menu.



(a) Start button (b) Region Scene button (c) Region Shot button (d) Shot progress bar (e) Scene progress bar

- 2 Click Start.
The render starts and its progress is shown in the Shot and Scene progress bars. The Start button label changes to Stop. When the Shot progress bar reaches 100% and the Render button is no longer highlighted (it again reads “Start”), the render is complete.
- 3 If needed, you can abort the process by clicking Stop.

Generating and Viewing Proxies

generating, proxiesproxies:generatingWhen working with high-resolution material in Lustre installations that do not include Incinerator, the speed of interaction can decrease substantially as grading effects are added, compromising real-time playback. For faster interaction with the application, you can generate lower resolution proxies of your footage and perform the colour grading on the proxies. After the grading is complete, you can easily render the colour grading data to the full-resolution version.

If you plan on using proxies on a project, it is recommended that you generate them at the beginning of the project so that you will have them available when needed. Proxies are stored in a sub-directory of the scans directory, at the same directory level as that of the original footage.

You can specify the proxy generation filter by selecting the one you need in the Rendering menu. See [Rendering Settings](#) (page 68).

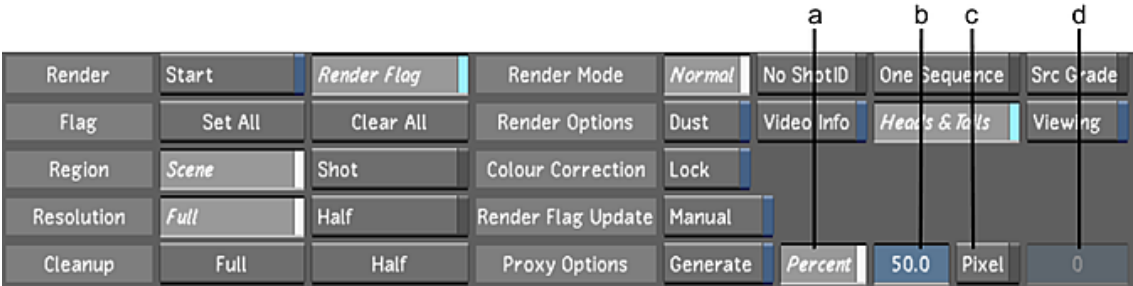
An alternative to generating proxies in Lustre is to create them using another means outside the application, and place them in a directory with a name composed of the resolution (for example, 1024x778). See [Recommended Directory Structure for Projects](#) (page 59).

NOTE Proxy generation differs from rendering a half-resolution render using the Half Resolution button in that grading and other effects data is not applied to proxies as it is when rendering the images.

To generate proxies:

- 1 Specify the proxy generation filter in the Rendering menu for the project configuration.
To override the filter specified in the configuration file, enter the appropriate proxy generation filter in the Command Line Renderer. See [Command Line Renderer](#) (page 613).
- 2 Load the scene and grade containing the cut for which you want to generate proxies. See [Selecting Scenes](#) (page 99) and [Loading Grades for a Cut](#) (page 106).
- 3 Navigate to the first shot in the cut for which you need proxies. You do not have to go to the beginning of the shot, as generation automatically starts at the first frame of the current shot.
- 4 In the Render Local menu, set the proxy size.

Enable:	To enter:
Percent	The size of the proxy as a percentage in the Percent field.
Pixel	The width of the proxy in pixels in the Pixel field.



(a) Percent button (b) Percent field (c) Pixel button (d) Pixel field

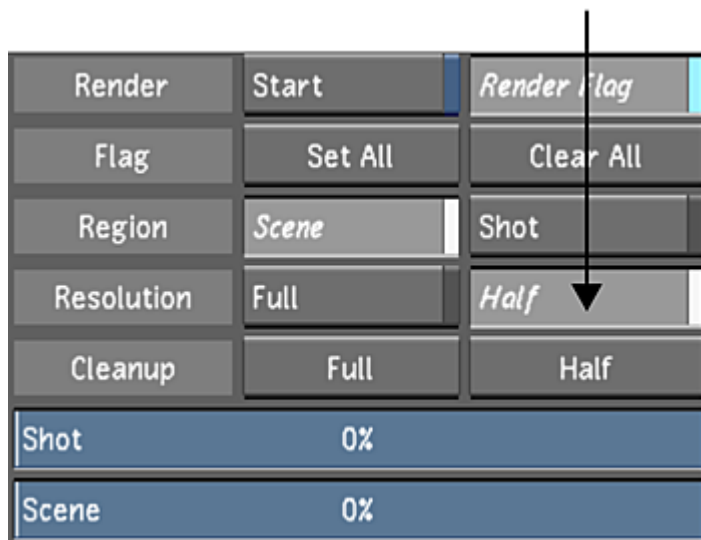
Modifying a value in one field automatically updates the value in the other field.

NOTE No other options in the Render Local menu affect generated proxies.

- 5 Click Generate.
The Generate button changes to a Stop button, and proxy generation starts at the first frame of the current shot. It continues through to the end of the cut unless you abort the process by clicking the Stop button.

To view proxies:

- 1 Do one of the following:
 - Enable the Half Resolution button in the Render Local menu or in the Grade menu.



- Set the Full/Half Resolution button to 1/2.



- Press F9.

NOTE An ungenerated proxy appears as a red X with a black background.

Generating Proxies for Matte Media in Multi-Channel Clips and Matte Containers

It is now possible to generate proxy media for matte clips inside a Multi-Channel clip and Matte Container. When generating proxies, only the matte defined in the Multi-Channel clip & Matte Container (the S track) is generated. If you enable the Render/Proxy Options/All option, all mattes located inside the Multi-Channel clip/Matte Container are generated, including any shots located on any timeline layers of the primary video track.

To automatically generate matte proxies for the secondary track (S):

- 1 Access the Render/Local menu.
- 2 From the Proxy options section, enable Generate.

To generate proxies for all mattes

- 1 Access the Render/Local menu.
- 2 From the Proxy options section, enable Generate and All.

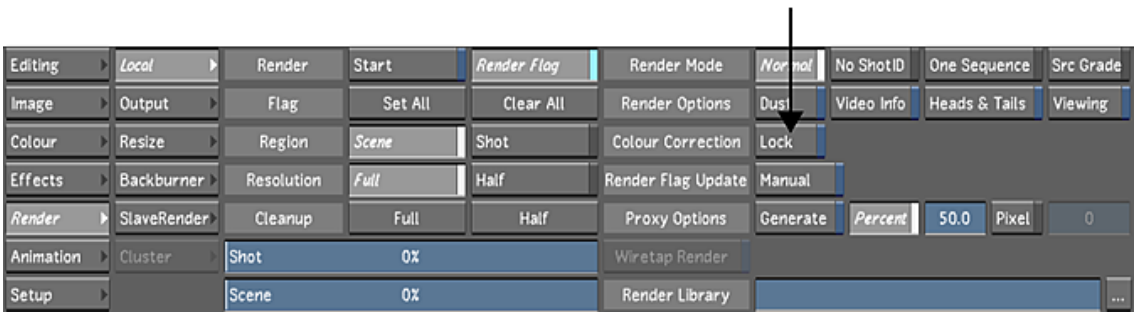
Locking Colour Grading

locking:colour gradegrades:lockingYou can lock the colour grading on the current shot so that no colour changes can be made to the shot. This is useful to avoid accidental modification once the grading is complete. For example, you might want to lock the colour grading after it has received final client approval.

NOTE Sparks plugin effects are also locked, but dust removal is not.

To lock colour grading:

- 1 Navigate to the shot for which you want to lock the colour grading.
- 2 Do one of the following:
 - In the Render Local menu, enable the Colour Correction Lock button.



- Enable the Locked flag in the Flags section by right-clicking on the Locked flag. A filled green circle indicates that the flag is enabled. See [Flagging Shots](#) (page 138).

The word “Locked” appears in the Printer Light fields and the shot can no longer be modified in any of the Colour menus until either the Lock button or Lock flag has been disabled.

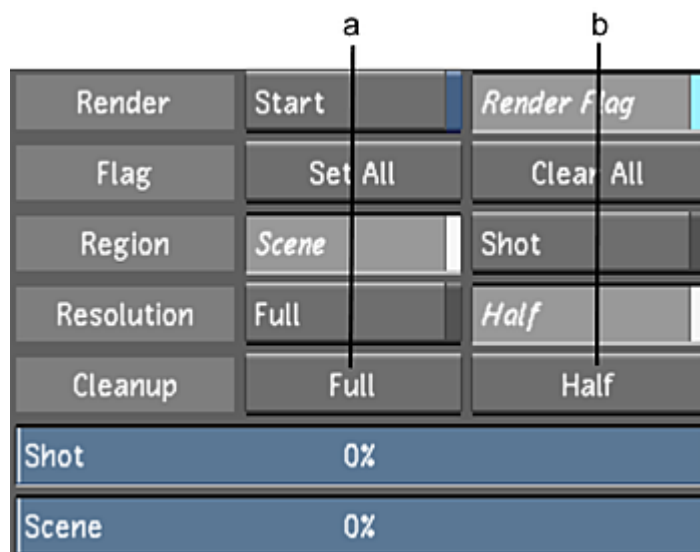
Cleaning Up Render Files

cleaning up, render filesrender files, removingYou can remove unneeded render files. Because renders are created separately for each grade (that is, grd01 to grd99), you may want to delete renders for grades that are not used anymore to free up storage.

To remove unneeded render files:

- 1 Load the grade that has associated unwanted render files. See [Loading Grades for a Cut](#) (page 106).
- 2 In the Main menu, click Render, and then click Local to display the Render Local menu.
- 3 Do one of the following.

Click:	To:
Cleanup Full and confirm	Remove all full-resolution render files associated with the grade.
Cleanup Half and confirm	Remove all half-resolution files associated with the grade.



(a) Cleanup Full button (b) Cleanup Half button

Rendering Shots as You Work

rendering:in the backgroundbackground rendering:overviewYou can render shots as you work on them using Lustre ShotReactor locally or remotely. As you move from shot to shot in the timeline, the previous shot is rendered using the ShotReactor, making the rendering process invisible and hence does not interrupt your work. If several shots are changed before Lustre has had time to render the last one, the changed shots are sent to a job queue.

By default, ShotReactor is installed locally on your Lustre station.

To install ShotReactor on a remote server, see [Autodesk Flame Premium Install Guides](#).

NOTE

- When rendering a multi-layer timeline, ShotReactor renders the shots that are visible from a flattened timeline, or the shots from the active layer in the multi-layer timeline, depending on the mode you are working in. For Solo mode, see [Multi-Layer Timeline](#) (page 277) and for Mute mode, see [Muted Layers](#) (page 305).
- Running a rendering service like ShotReactor on the creative workstation as a background task may impact interaction and playback performance, based on the resolution of your project, the configuration of the workstation, etc.

Files rendered with the ShotReactor are stored in the same directories as those used for renders created using the Render / Local menu. Directories are specified when you first create the project. To view the renders, use P (Print) view mode. See [Setting the View Mode](#) (page 320).

NOTE For information on setting up the ShotReactor, refer to the *Autodesk Lustre Software Installation Guide* for your platform.

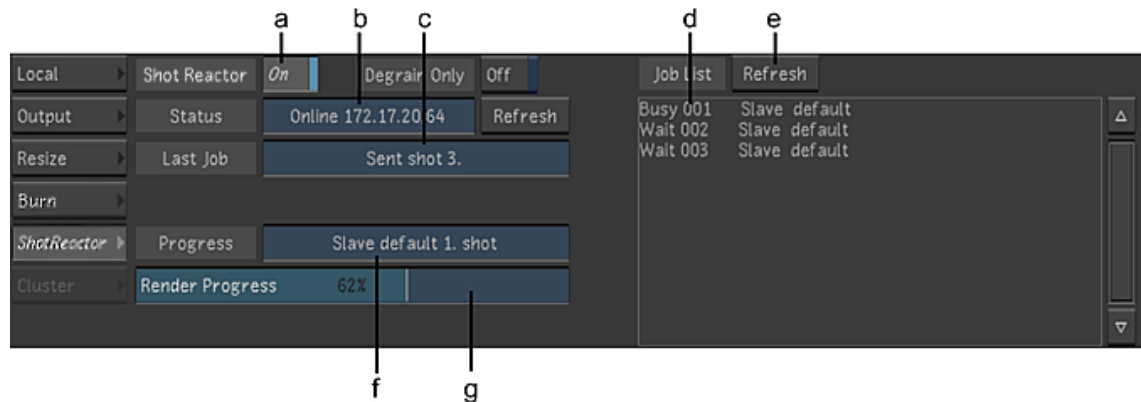
To render shots with the ShotReactor:

- 1 Do one of the following:
- 2 To use ShotReactor locally, make sure the IP address is set to <localhost>, in the *init.config* file. This is the default setting.

- 3 To use ShotReactor on a remote machine, make sure the IP address field is set to the ShotReactor machine's IP address set to <localhost>, in the *init.config* file.

NOTE To render at full resolution, enable Renders Full Res in the Network Rendering page of the project configuration. See [Network Rendering Settings](#) (page 78).

- 4 Start Lustre.
- 5 Access the Render / ShotReactor menu.



(a) ShotReactor On/Off button (b) Status field (c) Last Job field (d) Job List (e) Job List Refresh button (f) Progress field (g) Render progress bar

In the Status field, the status and IP address of the ShotReactor machine are displayed. If you are using ShotReactor locally, <localhost> is displayed in the Status field. This is the default setting.

TIP Click Refresh to update the Status field.

- 6 Set the ShotReactor On/Off button to On.
The letters BR in the upper-left corner of the screen indicate that ShotReactor is activated.



- 7 In the Render / Local menu, specify the region to render. See [Specifying the Shots to Render](#) (page 592).
- 8 When you want to render a shot with ShotReactor, modify a parameter and then move to the next shot.

TIP You can change the order of your shots in the Job List directly from the Job List.

- 9 To view the render status, display the ShotReactor menu.
The last job sent to the ShotReactor is displayed in the Last Job field. The last job sent is also the shot currently being rendered, and its name is displayed in the Progress field. The shot's render progress is indicated by the Render progress bar.

TIP The Render progress bar shows the shot's render progress as a percentage and updates every second. You can change the update interval using the Refresh in Seconds slider in the Network Rendering tab of the project configuration. See [Network Rendering Settings](#) (page 78).

- 10 When you have finished, you can turn off rendering with ShotReactor by setting the ShotReactor On/Off button to Off.

Any jobs remaining in the job queue are cancelled. playing:shots rendered with the ShotReactorShotReactor:playing shots rendered with

To play shots rendered by ShotReactor:

- 1 Navigate to a shot that has been rendered.
- 2 Enable P (Print) view mode.



- 3 Use the playback controls to play the shot.

NOTE If you have rendered files on the filesystem but Lustre does not “see” them, you can force a refresh by pressing **Shift** while enabling **P** in the user interface. The force refresh function is especially useful when background rendering processes are involved.

Using Multiple ShotReactor Servers

It is possible to use multiple Shot Reactor servers. Shot Reactor servers can be local or remote. To enable the use of multiple Shot Reactor servers, simply add the server identification in the ShotReactor section of Lustre `init.conf` file (as shown below) and restart the service, using the ShotReactor executable in the Lustre home folder.

```
<HostName string="localhost" />
<HostName string="Server1" />
<HostName string="192.168.2.2" />
<HostName string="10.10.10.1" />
```

NOTE The timeout token is now obsolete and can be removed from the configuration file.

When using multiple servers, the rendering tasks are divided by the amount of available servers. For example, for a shot that is 100 frames long, using two servers will dispatch the first half of the task to the first server (starting at frame 1) and the second half to the second server (starting at frame 51). When working in Stereo3D mode with two servers, Left and Right track tasks are sent to different servers concurrently, so both eyes are rendered at the same time. This way, you can start playback and see the Stereo3D content.

NOTE Using a single Shot Reactor with Stereo3D content renders the Left and Right media interleaved so playback can be started as soon as a few frames are rendered. The ShotReactor status (located on top right of the screen) and the ShotReactor flag are now updated when playback starts. This can be enabled or disabled using the Update In Playback option, located in the Render/ShotReactor menu. These options are saved with the user settings on a project basis.

The ShotReactor servers list, in the Render/ShotReactor menu, shows the name of the server and its status:

- Green = Connected
- Yellow = Attempting to Connect
- Red = Disconnected

You can select a Shot Reactors in the Shot Reactor list and press Online to start/stop the server. Better management of rendering tasks for shots that are already part of the ShotReactor queue. Better messaging for current rendering tasks.

In a dual GPU configuration, Shot Reactor only uses a single GPU (GPU 0). In a shared/network storage configuration, Shot Reactor does not need to be aware of the networking infrastructure, making it possible to use Gig-E, 10 GigE or InfiniBand for connectivity between workstations, storage and ShotReactor servers. Follow the steps outlined below to share your workstation's local storage to enable the Shot Reactor servers to render your content at the right location:

- 1 On the creative workstation with local attached storage, export the storage. This example assumes an IB connection and local storage. Workstation InfiniBand address (for this example): 10.10.11.70.
- 2 As root, edit the `etc/exports` file and add: `/mnt/StorageMedia *(rw,no_subtree_check,async)`.
- 3 On each Shot Reactor server, create a mount point for the storage: `mkdir /mnt/Host`.
- 4 As root, edit the file `/etc/fstab` and add: `10.10.11.70:/mnt/StorageMedia /mnt/Host nfs rw,bg,hard,intr 0 0`.
- 5 Restart the NFS service and mount the storage on the Shot Reactor workstations: `systemctl restart nfs-server.service mount -a`.

NOTE If you have to reboot the Host workstation, make sure to unmount the Host path from the ShotReactor workstations.

- 6 Create a Flame Premium or a Lustre project Import your content, grade it, and use your Shot Reactor servers for rendering.

NOTE The more Shot Reactor servers you add to your system, the more bandwidth is required. Playback performance may be impacted if you are using many servers rendering content to your storage.

Rendering with Burn for Lustre

Burn for Lustre:overviewrendering:with Burn for Lustre Burn for Lustre is no longer installed by default with Lustre. It has its own installer.

Burn for Lustre allows shots to be rendered using Linux servers set up on the network, speeding up the rendering process and freeing up the Lustre stations. On a 2K film project, for example, half-resolution versions could be rendered on the local workstation and 2K final versions rendered with Burn for Lustre. Or, when you are satisfied with the grade of a reel, use the render farm to render 1K or 2K versions of it. When rendering a multi-layer timeline, Burn only renders the flattened timeline. It does not take into account the Solo or Mute status, since these modes are not saved in the grade.

Files rendered using Burn for Lustre are stored in the same directories as those used for renders created using the Render Local menu. Render directories are set up in the Render / Burn menu.

To view and manage jobs sent to the render farm, use Backburner Manager and Backburner Monitor.

Remote Rendering with Burn and Wiretap

Burn for Lustre allows rendering of footage either:

- Stored in the local storage array
- Imported via Wiretap. If rendering footage imported via Wiretap, the footage must be located on the Stone filesystem.

The destination is specified in the Burn Render Fulls Home. It could be:

- the local storage array
- shared network storage
- the Stone filesystem via Wiretap

Command Line Render

```
./render -s <scene_name> -g <grd_name> -r <output_resolution> -i -1
192.23.200.76:/L:/lustre_project -2 192.9.200.19@wt:/stonefs/project/library -3
192.23.200.76:/L:/renders/full
```

NOTE Use the -i option to render, taking trim information into account.

For more information, see [Command Line Renderer](#) (page 613).

Starting Backburner Manager

rendering:BackBurner Manager, startingBackburner Manager, startingBefore you can start a network render, you must start Backburner Manager on a Windows or Linux workstation designated as the Manager, and start Backburner server on each rendering server.

The Backburner Web Monitor has all the features of the Windows-based Backburner Monitor. The Backburner Web Monitor runs in a Web browser from any workstation on the network. You can use it to view and control jobs currently being processed. Jobs in the Distributed Queueing System can be stopped, restarted, reordered, archived, or removed. You can monitor the overall health of the Distributed Queueing System and identify any Render Nodes that are not working. See the *Autodesk Backburner User Guide*.

For details on starting and configuring Backburner Manager, see the Backburner Installation Guide.

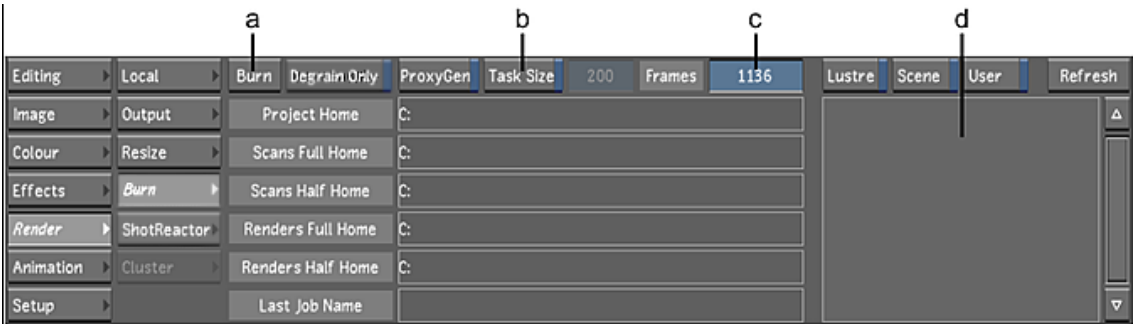
Submitting a Remote Render Job

Burn for Lustre:rendering remotelyrendering:remotely with Burn for LustreYou can render one shot, several selected shots, or all shots in a scene using Burn for Lustre. Jobs are submitted from the Render / Burn menu, where you can also monitor job progress.

To render a selected region using Burn for Lustre:

- 1 Load the cut containing the shots you want to render. See [Managing Cuts](#) (page 101).
- 2 Apply the required colour grading changes, and then save the grade.
- 3 If you do not wish to render out the entire sequence, flag the shots you wish to render. See [Flagging Shots](#) (page 138).
- 4 Click Render and then click Burn.

The Render / Burn menu appears.



(a) Burn button (b) Task Size button (c) Frames field (d) Job list

- 5 If needed, change the size of the task (in number of frames) sent to individual Linux systems by enabling the Task Size button and then changing the value in the Task Size field.

NOTE It is recommended that you save the grade file before proceeding to the next step. If not, changes made in the Render menu might not be submitted to the render farm. Press **S** on the keyboard to save your changes.

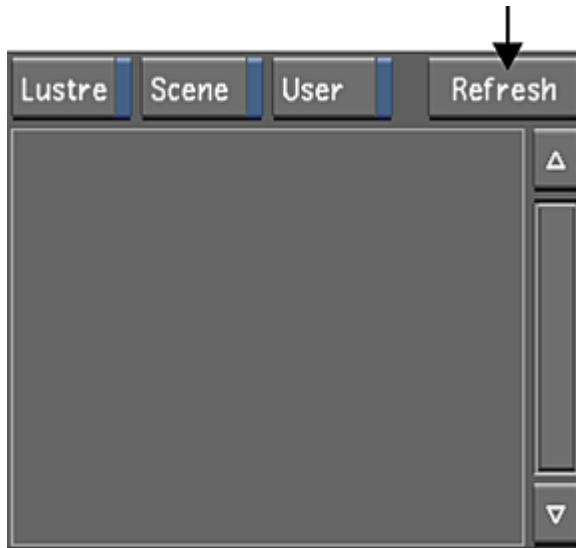
- 6 Click Burn.

The job is submitted to Backburner, which then queues and distributes it to the render farm. The last successfully submitted job appears in the Last Job Name field. If the job submission was unsuccessful and nothing appears in the Last Job Name field, check for errors in the Lustre console. Otherwise, check for errors in the Backburner Monitor.

NOTE The total number of frames in the cut is displayed in the Frames field, for reference.

To monitor job progress:

- 1 In the Render / Burn menu, click Refresh.



- 2 All submitted jobs appear in the Job list. This is the same list of jobs shown in the upper-left panel of the Backburner Monitor. See [Monitoring the Render Tasks with Backburner Monitor](#) (page 613).
- 3 To view a subset of the jobs, apply a filter to the job list by enabling one or more of the filter buttons above the job panel.

Enable:	To view:
Lustre	Only jobs submitted from Lustre (as opposed to other Autodesk applications such as Flame or Combustion).
Scene	Only jobs for the currently loaded scene.
User	Only jobs submitted by the current user.

Monitoring the Render Tasks with Backburner Monitor

Backburner Monitor:monitoring render tasksrendering:monitoring with Backburner MonitorDuring an active render session, you can use Backburner Monitor on any Windows workstation on the network to view and edit jobs that are in process or in the job queue, as follows:

- 1 On the render monitor workstation, choose Start > Programs > Autodesk > Backburner > monitor.
- 2 If no servers or data appear in the Backburner Queue Monitor, the Backburner Manager was not found with the current settings. Choose Manager > Connect to connect to the Backburner Manager. Enter localhost if you are using Backburner Monitor on the same workstation as Backburner Manager. Otherwise, enter the IP address of the workstation on which Backburner Manager is running. When Backburner Manager is found, its name appears in the title bar and the list of servers is updated.
- 3 To view and edit jobs: In the Job list, select a job. The columns in the Job list include Order, Priority, State, Progress, and Owner. The Job Summary, Task Summary, and Job Details panels are updated to reflect the selected job. In the Job list, right-click a selected job to choose from a list of operations. For example, activate, suspend, delete, or restart the current job.

Command Line Renderer

The Command Line Renderer allows you to render shots by entering a command in a Linux shell instead of using the Render / Burn menu. Use the bbsolver.log file describing the Command Line Renderer output to view error messages and other pertinent information.

Run the Command Line Renderer on the machine you want to render on. Files rendered using the Command Line Renderer are stored in the same directories as those used for renders created using the Render Local menu. Render directories are set up in the Project menu.

The Project Home directory must be specified when you use the Command Line Renderer. The Scans home and Renders home directories must also be specified if they are not sub-directories of the Project Home directory. You can specify these directories in two ways. You can either use the -1, -2, and -3 parameters in the command line, or you can set them as environment variables on the Linux server.

To use the Command Line Renderer, Burn for Lustre must be installed and licensed on each machine (node). Burn is no longer installed with Lustre; it has its own installer.

Syntax: ./render -s <scene_name> -g <grade_name> -o <output_file_format> -r <output_resolution>

Parameters

Par.	Modifier	Description	Req'd	Comments
-s	<scene_name>	The name of the scene containing the grade and associated cut you want to render.	Yes	
-g	<grade_name>	The name of the grade and associated cut you want to render.	Yes	

Par.	Modifier	Description	Req'd	Comments
-o	<output_file_format>	The file format of the render files. Valid modifiers: cin, dpx, tga, sgi, tif or bmp.	Yes	
-r	<output_resolution>	The resolution of the render files. Valid modifiers: full, half.	Yes	
-l	<video_format>	Renders to a specified video format. Valid modifiers: HD, PAL, or NTSC.	No	
-1	<project_home_folder>	The path and directory name of the Project Home directory, including the drive letter. Example: G:\ProjectAB	No	Not required if set as environment variables on the local machine.
-2	<footage_home_folder>	The path and directory name of the original footage directory, including the drive letter.	No	Not required if set as an environment variable on the local machine.
-3	<renders_home_folder>	The path and directory name of the render files directory, including the drive letter.	No	Not required if set as an environment variable on the local machine.
-n	<number_shots>	The number of shots, starting from the first shot in	No	Use only when rendering to Lustre ShotReactor.

Par.	Modifier	Description	Req'd	Comments
		the cut, to be rendered.		
-f	<first_frame last_frame>	Renders a range of frames within the set of shots defined for rendering. Example: -f 120 340	No	Can be used to specify a new range when restarting a cancelled render.
-a	<start_fr_no end_fr_no>	Renders a range of frames in the timeline, between the Start Frame number and End Frame number. Example: -a 140 480	No	Do not use this parameter with other parameters that specify a subset of shots.
-i	None	Renders shots taking trim information into account.	No	
-e	<preset>	Name of output colour space preset, if used.	No	
-t	<number_of_threads>	Specifies the number of threads, or processors, used for processing. You can opt to use only one of two processors. Example: -t 1	No	On Linux machines, you must set this parameter to -t 2.
-w	None	Renders wedges to the same place.	No	Same as No Wedge option.

Par.	Modifier	Description	Req'd	Comments
-q	None	Renders to one sequence.	No	Same as One Sequence option. If neither -w nor -q are specified, Normal is used. This parameter should be used with -i.
-p	<part_of_frame>	Renders a fraction of the shots in the cut. Express the modifier as a fraction, for example, <1/4> would render the first 25% of the shots.	No	You can use this parameter to divide the job between several machines.
-u	None	Renders dust removal data.	No	
-k	None	Renders with timecode burned in.	No	
-L	None	Render using the Normal filter for reposition.	No	
-M	None	Render using the Mitchell filter for reposition. There are three parameters (s = size; B = blur; C = ringing).	No	
-T	None	Render using the Catmull-Rom filter for reposition.	No	
-O	None	Render using the new type Lanczos3lobe filter for reposition.	No	

Par.	Modifier	Description	Req'd	Comments
-d	None	Debug level.	No	
-h	None	Print help to command prompt window.	No	Use this parameter by itself. Example: render -h.

Example of Use

```
render -s alabama -g grd21 -o dpx -r half -i -q -1 g:/project1 -n 1
```

Where alabama is the scene name, grd21 is the grade name, dpx is the output format, and g:/project1 is the Project Home directory as mapped from the local (rendering) machine.

To render one or more shots with the Command Line Renderer in Windows:

- 1 Open a Command Prompt window on the machine on which you want to render the shots by choosing Start | Programs | Accessories | Command Prompt.
- 2 Go to the Lustre application directory by typing: `cd C:\Program Files\Autodesk\Lustre <version_number>` where C is the local drive.
- 3 Enter the render command using the syntax provided in the previous table.

To render one or more shots with the Command Line Renderer in Linux:

- 1 Open a Linux shell.
- 2 Go to the Lustre application directory by typing: `cd /usr/autodesk/lustre_<version_number>`
- 3 Enter the render command using the syntax provided in the previous table.

Rendering Grades Created in Releases Prior to Lustre 2011 Extension 1

Due to the enhancements in the GPU, we do not recommend using Lustre to render grades created in Lustre 2011 or earlier if you are looking for pixel accuracy rendering.

To be able to render grades created before Lustre 2011 Extension 1 using the older HLS/Blur algorithm:

- 1 In a text editor, open the init.config configuration file.
- 2 Add the following keyword in the Miscellaneous section:

```
<GPUHLSKeyerBackwardCompatibility state= "On" />
```

- 3 Restart Lustre.
- 4 Load and render the grade.

NOTE

This keyword must be enabled in any init.config configuration file used by Lustre or Lustre render services (Lustre ShotReactor, Burn, etc). Also, verify that the keyword is disabled from init.config configuration files before creating new content in Lustre 2011 Extension 1. If not, all newly created grades will use the older HLS/Blur algorithm.

To disable the keyword:

- 1 Do one of the following:
 - Remove the keyword from the init.config configuration file
 - Set the keyword to:

```
<GPUHLSKeyerBackwardCompatibility state= "Off" />
```

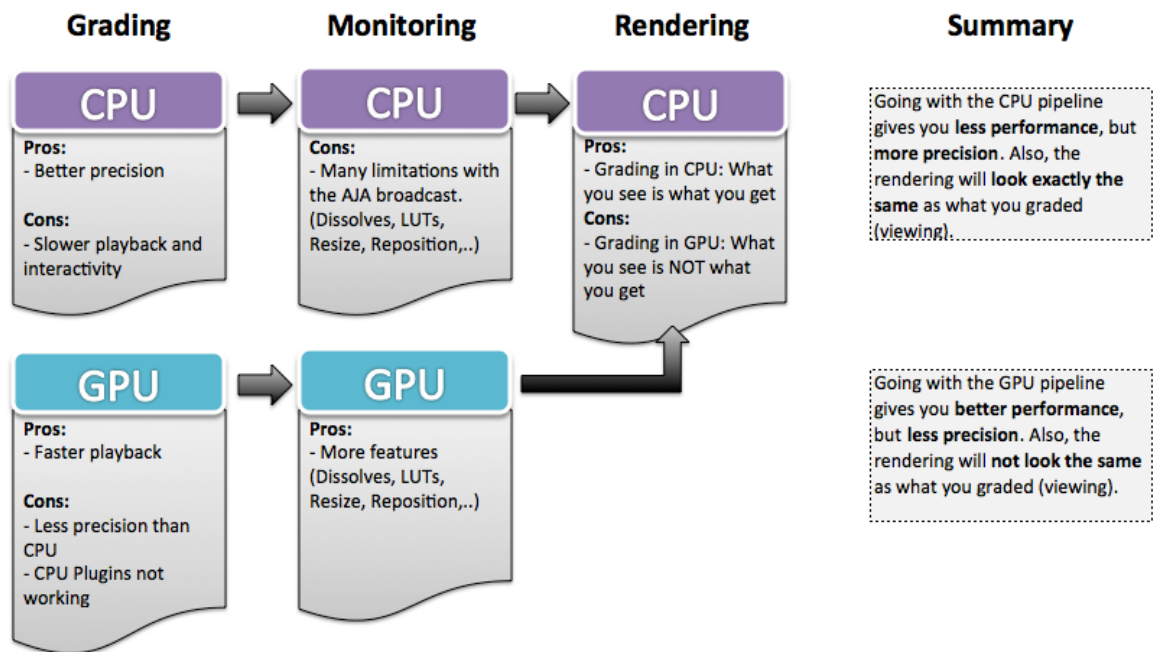
NOTE

When using Incinerator, this keyword does not apply. Incinerator uses CPU rendering only and does not use the GPU to accelerate the keyers and Blur.

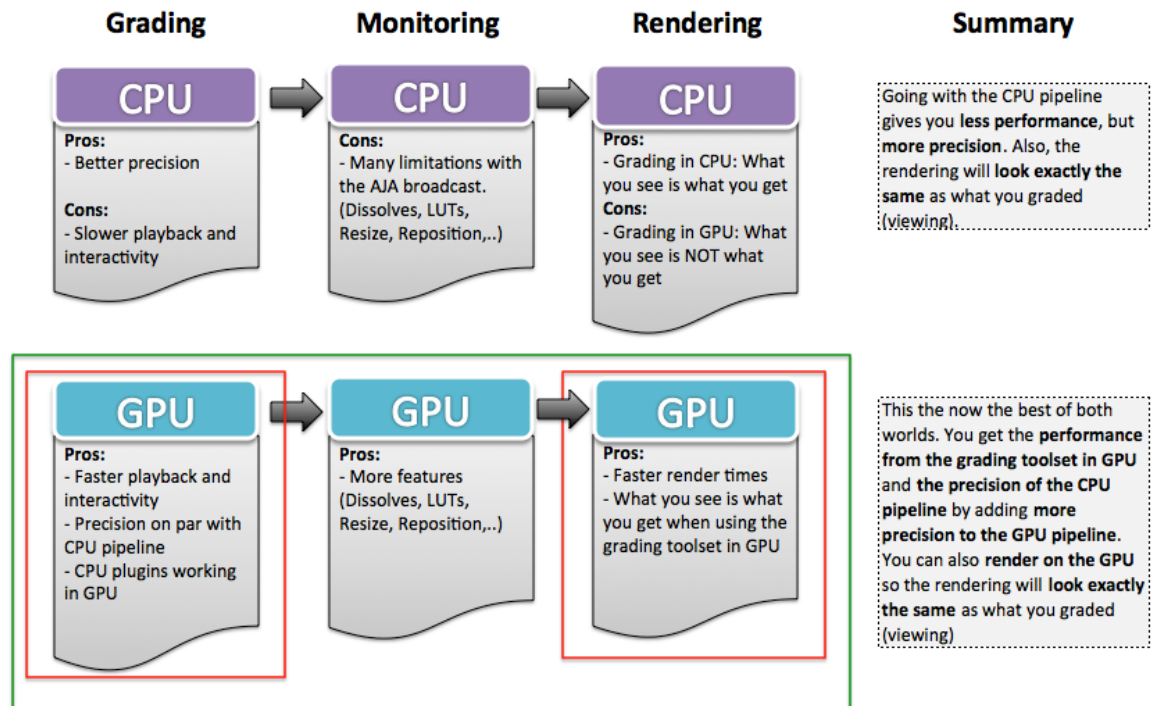
About Lustre Reactor

GPU Rendering

- Lustre Reactor is a game changing GPU accelerated playback and rendering pipeline for color correction, blur, keying and softness, introduced in Lustre 2016 Extension 2, enabling significantly faster and more precise processing, compared to previous versions.



Before Lustre 2016 Extension 2



After Lustre 2016 Extension 2

- Lustre Reactor can also be used for local rendering and with Shot Reactor, Burn and command-line rendering. Type `render -h` for the Command Line Help file.

NOTE See Autodesk Burn documentation for recommended GPUs.

Lustre Reactor

- The GPU can be used for both interactive and grade rendering. This is a high fidelity solution, meaning that decisions made in the grading suite now correspond to what is rendered on disk.
- To use Lustre Reactor, make sure the GPU button is enabled (it is enabled by default). If disabled, the CPU pipeline is used for both interactive and rendering.
- Shot Reactor has been configured to use the GPU. If you are running Shot Reactor on a remote rack mounted 1U server, the NVidia Q6000 is required.



NOTE

- CPU rendering is currently still available, making it possible to render grades created in previous versions of Lustre and to obtain a matching result. However, bear in mind that future versions will probably exclusively use Lustre Reactor.
 - CPU-only plugins remain available when the GPU is enabled. They are still processed by the CPU, but are not incompatible when in GPU mode.
-

Matte Rendering

It is possible to render the currently selected Matte when rendering the grade. To render a Matte, do the following:

- 1 Enable Matte view.
- 2 Select the Secondary containing the Matte you want to render.
- 3 Render the scene or shot.

The Matte media is rendered, using the current Render Naming convention of the Render node used.

Supported Configurations

The following hardware configurations are supported for use with Lustre Reactor:

- HP 8600 / NVidia FX5800
- HP Z800 / NVidia FX5800
- HP Z800 / NVidia Q6000
- HP Z820 / NVidia Q6000
- HP Z820 / NVidia K6000
- HP Z840 / NVidia K6000

■ HP Z840 / NVidia M6000

Performance may vary based on resolution, frame rate and media format.

NOTE

- For workflows using GPU Decoding of RED or ARRIRAW content, configurations with K6000 or M6000 should be privileged.
 - In order to improve playback performance with high resolution content, you can set the Matte Resolution to Half Resolution. If you intend to add a Blur effect to the matte, Half Resolution should be used.
 - It is also recommended that you select 'Center', in the Project Settings / Engineering tab, next to the Graphic SDI heading, to avoid resizing issues when enabling / disabling GPU while AJA SDI Preview is enabled.
-

Media Export (Linux Only)

27

About Background Media Export

Lustre 2013 supports a media encoding service called Media Converter. The Media Converter allows Lustre to offload encoding tasks to Wiretap Gateway servers (Linux and Mac OS X). This means that you can continue working on your project while media files are being generated in the background, even if you are using your local Wiretap Gateway server. It offers the ability to encode streaming formats such as Quicktime, MFX, graphic files like Jpeg, DPX and Tiff. and audio files like AIFF, Wave and mp3. It also adds support for formats and codecs only available on specific operating systems (Apple ProRes) and leverages your networking infrastructure (InfiniBand, 10-Gig, etc). The tasks are managed by Backburner Manager, the Autodesk queue management system. This means that facilities can centralize the management of these tasks without disturbing the creative suite and use a web browser to monitor and edit the tasks.

The Media Export workflow in Lustre is based on Export Versions: export configurations that are linked to a grade. Consequently, all the exports you create can be recalled for future use. Numerous options are available to suit multiple file delivery workflows.

You can define the Wiretap Gateway server used for background media export. It can be local or remote. Unless otherwise specified, the default Wiretap Gateway Server is set to "localhost".

To set up a stand-alone Wiretap Gateway server for media encoding, see [Stand-Alone Wiretap Gateway Server Configuration for Media Encoding](#) (page 637).

Setting the Render Location during Project Creation

Define the location of the exported media files, in the Rendering tab, when you create the project or after the project is created in the Project Settings. The path can be local or remote.

- To export locally, set the path to:

/[PROJECT_HOME]

- To export to a remote location, the path must be in the following format:

Remote_Host_Name@wtg:/[PROJECT_HOME]

For example: Upton@wtg:/[PROJECT_HOME]

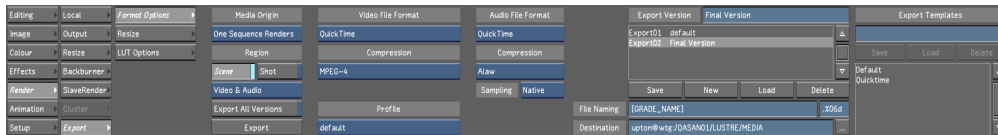
The Export Panel

The Export Panel is a sub-menu of the Render menu. It is divided into three sub-menus:

Sub-menu:	Description:
Format Options	Use to define file format options used for export, media location and the Wiretap Gateway Server used for the export tasks.
Resize	Use to define the output resolution and the Resize options of the exported media files.
LUT Options	Use to apply a LUT to the media files to be exported.

Settings Common to the Three Export Sub-Menus

The first column of options, along with the Export Versions and Export Templates boxes, are common to all Export sub-menus.



Media Origin: Defines the type of media used for export. The options are:

- **Source Grade Renderers:** Source Grade rendered files are used to create media files on a shot basis.
- **One Sequence Renderers:** One Sequence rendered files are used to create one media file for the entire grade.
- **Original Media:** Uses the original media files for the export. No grades are applied.

NOTE Because the Export service requires media files to be saved to disk, you must render your grades in Lustre prior to exporting. If you set off an export prior to rendering you grades, Lustre automatically starts the rendering process in the mode corresponding to your export options (One Sequence or Source Grade) and exports the file once rendering is complete.

Region: Enable Scene to export the entire timeline or enable Shot to export only the current shot. Available when Media Origin is set to Source Grade rendered or Original Media.

Media Selector: Use to define attributes of the exported media. Options are:

- **Video Only:** Only video stream is exported.
- **Video & Audio:** Video and audio stream is exported.
- **Audio Only:** Only audio stream is exported.

Export All Versions: If you created multiple Export versions, enabling this option will add them all as jobs in the queue.

See [Export Versions](#) (page 631).

Export: Click to start the Export tasks.

Export Version: Use to create, update, load and delete Export Versions.

You can create multiple Export Versions, with different export settings for the same grade. Export Versions contain all the data required to define an export job and are stored in the Library folder, alongside the grade metadata file. Export Versions are named after the grade they are associated to:

- grade01_export01, grade01_export02, etc.

You can add a comment to an Export Version, which appears alongside the export name:

- Export01 Final Version

See [Export Versions](#) (page 631).

File Naming: Use tokens to define the filename of the exported file(s). The default value is [GRADE_NAME] for One Sequence Renders and [ORIGINAL_FILENAME]_[GRADE_NAME] for Source Grade Renders.

To create a folder, type a token in the file name field followed by "/". This creates a folder in the destination location.

The following tokens can be used:

- [PROJECT_NAME]: The name of the current project.
- [PROJECT_HOME]: The home folder of the project.
- [SCENE]: The current scene.
- [USER]: The current user settings.
- [GRADE_NAME]: grd01 is the grade name.
- [GRADE_NOTE]: Text data entered by user and appearing to the right of the grade in the grade list.
- [CUT]: The name of the cut.
- [UID]: The shot-based UID.
- [RESOLUTION]: The resolution of the exported media.
- [REEL_NAME]: The reel/tape name of the source clip.
- [STEREO_LAYER]: Left or Right.
- [ORIGINAL_FILENAME]: The original file name of the source clip (without the file extension).
- [DATE]: Current date in YY_MM_DD format (i.e. 2011_11_29).
- [TIME]: Current job starting time in HH_MM_SS format (i.e. 22_12_10).
- [EXPORT_VERSION]: Current export version name.
- [EXPORT_NOTE]: Current export version note.

NOTE For file sequence exports, you can define the file padding value. If the selected file format is not a file sequence format, the padding field is greyed out.

Destination: Displays the destination folder for the exports, as defined by the project settings. You can change the destination folder by clicking on the browse button. When browsing for a destination folder, only Wiretap Gateway servers are displayed. You can select different Wiretap Gateway servers than your default server. The path must be in the following format:

[EXPORT_HOST]@wtg/[PROJECT_HOME]



NOTE When you select a different Wiretap Gateway server, the Wiretap Gateway Server option field is updated. This action also refreshes the available codecs list.

Once you select a Wiretap Gateway server, you can select an existing folder or create a new one as your destination folder.

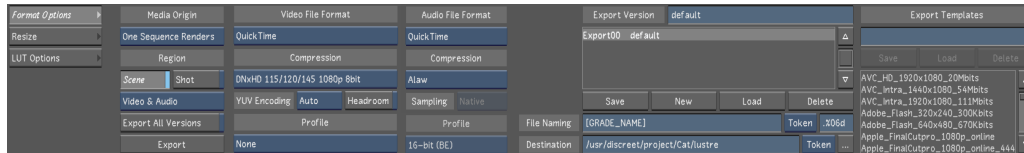
Export Templates: Use to save, load and delete Export Templates. An Export Template contains one or more Export Versions.

See [Export Templates](#) (page 632).

The Format Options Tab

Adjust the values in the Format Options tab to define your Wiretap Gateway server and the file format export options.

Format Options Tab - Video Settings



Video File Format: Use to select the file type for the export of the video stream.

Compression: Displays the list of available codecs based on the selected Wiretap Gateway server. See [Wiretap Gateway Supported Media File Formats](#) (page 192) for a complete list of supported media file formats.

NOTE The list only displays the available codecs that are compatible with the resolution, frame rate and bit depth of the current grade.

YUV Encoding The YUV Encoding box allows you to select the YUV colour space to use when exporting the clip. Because Lustre works in the RGB colour space, it needs to translate RGB information into YUV . This setting ensures that the right decoder is used for this. The Auto setting selects the colour decoder based on the resolution of the clip. Options are:

- Auto
- Rec601
- Rec709
- Rec2020

The Auto option uses Rec601 for standard definition clips and Rec709 for everything else. Specifying the wrong colour space results in colours that are off.

Headroom Enable to include YUV headroom on export for Quicktime and MXF files.

Profile: You can select a pre defined profile for certain video file formats. Selecting a profile populates all the relevant parameters for the export.

Each codec can be configured to produce different results. Data rate, video range, etc. can be edited to account for many file delivery requirements. The codec profiles are located in:

/usr/discret/mediaconverter/2013.0.0/profiles/<file format>/<essence>/<compression>

File Format:

- QuickTime
- MXF

Essence:

- Video
- Audio

Compression:

- The codec in question.

Each codec has a default value, located in the <default.xml> file.

H264 Codec Profiles

For H264, multiple preset profiles are available:

H264 Codec Profile:	Description:
Baseline_1SEG_384Kbits	H264_CIF 352x288 or 352x240 at 384 kbit/s, Baseline profile.
Baseline_3GP_256Kbits	H264_FLASH_LOWRES 320x240 at 300 kbit/s, Baseline profile.
Baseline_600Kbits	H264_BASELINE 320x240 at 600 kbit/s, Baseline profile.
Baseline_Adobe_300Kbits	H264_FLASH_LOWRES 320x240 at 300 kbit/s, Baseline profile.
Baseline_Apple_1_5Mbits	H264_iPOD Apple iPod, 320x240 at 1.5 Mbit/s, Baseline profile.
Baseline_Apple_400Kbits	H264_iPOD Apple iPod, 320x240 at 400 kbit/s, Baseline profile.
Baseline_Apple_600Kbits	H264_iPOD Apple iPod, 320x240 at 600 kbit/s, Baseline profile.
Baseline_Apple_970Kbits	H264_iPOD Apple iPod, 320x240 at 970 kbit/s, Baseline profile.
Baseline_CIF_600Kbits	H264_CIF 352x288 or 352x240 at 600 kbit/s, Baseline profile.
Baseline_RIM_12Mbits	H264_BASELINE 1920x1080 at 12 Mbit/s, Baseline profile.
Baseline_RIM_20Mbits	H264_BASELINE 1920x1080 at 20 Mbit/s, Baseline profile.
Baseline_RIM_4Mbits	H264_BASELINE 1920x1080 at 4 Mbit/s, Baseline profile.
HDTV_1080i_10Mbits	H264_HDTV_1080i 1920x1080 at 10 Mbit/s, High profile, interlaced.
HDTV_720p_8Mbits	H264_HDTV_720p 1280x720 at 8 Mbit/s, High profile.
High_1080i_6Mbits	H264_HIGH 1920x1080 at 6 Mbit/s, High profile, interlaced.
High_AVC_HD_20Mbits	H264_AVCHD AVCHD, 1920x1080 at 20 Mbit/s, High profile, interlaced.
High_AVC_Intra_111Mbits	H264_INTRA_CLASS_100 AVC Intra Class 100, 1920x1080 at 111 Mbit/s, High 10 profile, interlaced.
High_AVC_Intra_54Mbits	H264_INTRA_CLASS_50 AVC Intra Class 50, 1440x1080 at 54 Mbit/s, High 10 profile, interlaced.

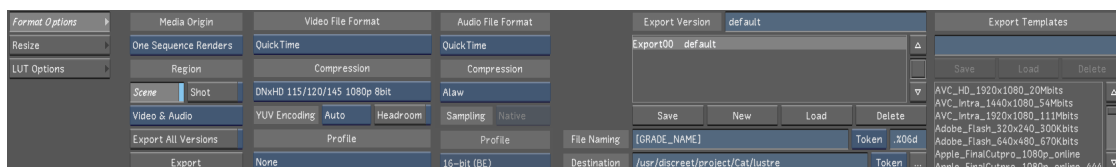
H264 Codec Profile:	Description:
High_Blu_Ray_20Mbits	H264_BD_HDMV Blu-ray HD, 1920x1080 at 20 Mbit/s, High profile, interlaced.
High_Blu_Ray_8Mbits	H264_BD Blu-ray SD, 720x576 or 720x480 at 8 Mbit/s, High profile, interlaced.
High_Divx_2Mbits	H264_DIVX DivX+, 1920x1080 at 2 Mbit/s, High profile.
High_DVD_3Mbits	H264_DVD 720x576 or 720x480 at 3 Mbit/s, High profile, interlaced.
High_HD_DVD_20Mbits	H264_HD_DVD 1920x1080 at 20 Mbit/s, High profile, interlaced.
High_Microsoft_10Mbits	H264_SILVERLIGHT Microsoft Silverlight, 1920x1080 at 10 Mbits/s, High profile.
High_Microsoft_500Kbits	H264_SILVERLIGHT Microsoft Silverlight, 640x480 at 500 kbits/s, High profile.
Main_3Mbits	H264_MAIN 704x576 or 704x480 at 3 Mbit/s, Main profile.
Main_Adobe_670Kbits	H264_FLASH_HIGHRES 640x480 at 670 kbit/s, Main profile.
Main_Apple_1_8Mbits	H264_MAIN 1024x576 at 1.8 Mbit/s, Main profile.
Main_Apple_4_5Mbits	H264_MAIN 1280x720 at 4.5 Mbit/s, Main profile.
Main_D1_3Mbits	H264_D1 720x576 or 720x480 at 3 Mbit/s, Main profile, interlaced.
Main_Sony_2Mbits	H264_PSP_640x480 Sony PSP Level 3, 640x480 at 2 Mbit/s, Main profile.
Main_Sony_700Kbits	H264_PSP Sony PSP, 320x240 at 700 kbit/s, Main profile.
Main_Sony_900Kbits	H264_PSP_480x270 Sony PSP Level 2, 480x272 at 900 kbit/s, Main profile.
Main_SVCD_1_15Mbits	H264_SVCD 480x576 or 480x480 at 1.15 Mbit/s, Main profile, interlaced.

The H264 codec profiles are located in:

/opt/Autodesk/mediacconverter/<version>/profiles/QuickTime/video/H264

NOTE Some H.264 codec profiles are also used by some Export Templates. Keep this in mind if you plan to modify some of the parameters within the codec profiles. Your changes will be reflected in the Export Templates.

Format Options Tab - Audio Settings



Audio File Type: For streaming formats, like QuickTime and MXF, the Audio File Type menu is automatically set to the Video File Type. There may be situations in which you require a separate audio stream. For example, if you export the video stream as a DPX file sequence, you can select a standalone audio file format (.aiff, .wav, .mp3, etc.). [Wiretap Gateway Supported Media File Formats](#) (page 192) for a complete list of supported media file formats.

Compression: Use to select the audio compression settings. Options are:

Sampling: Use to define the sampling frequency of exported audio files. Options are:

- Native
- 11Khz
- 22Khz
- 44.1Khz
- 48Khz

Lustre's behavior when exporting audio depends on the type of render mode selected. To export media files with audio, Lustre uses the grade-based audio file when the Media Origin is set to OneSequence. If you select Source Grade or Original Media and you are working with media files that contain audio media, such as Quicktime, MXF, R3D, the exported audio will come from the source media files.

Profile: When exporting Quicktime movies with PCM audio, you can select an audio encoding profile to define the bit depth and the bit ordering. The following profiles are available:

- 16-bit (LE)
- 16-bit (BE)
- 24-bit (LE)
- 24-bit (BE)
- 32-bit fp (LE)
- 32-bit fp (BE)

NOTE LE: little endian; BE: big endian. Endianness has no impact on performance, and little endian should work in most cases. Output in big endian mode if you expect compatibility issues with the target application / operating system.

Summary:

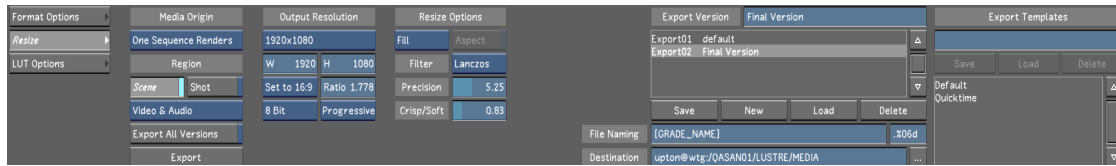
- **Source Grade Renders:** Lustre uses the source audio of each clip for the render and re-encodes it to the selected format.
- **One Sequence Renders:** Lustre uses the timeline's audio and re-encodes it as one multi-channel audio track (the number of channels depends on the selected output format).
- **Original Media:** Lustre uses the source audio of each clip for the render and re-encodes it to the selected format.

NOTE

- You must select an audio output format that supports the number of audio channels you are exporting. For example, if you are exporting a four channel audio file to mp3, channels 3 and 4 will be discarded during the encoding as the mp3 format only supports up to two channels.
 - When exporting audio, Lustre will re-encode to the bit depth of either your source audio or your timeline audio, based on your export mode, as long as the selected output format supports that bit depth. If it does not support the bit depth, the export defaults to a lower bit depth, supported by the selected output format.
-

The Resize Tab

Adjust the values in the Resize Options tab to define the destination resolution and the framing of the exported media.



Output Resolution: Use to define the output resolution, aspect ratio, bit depth and scan mode of the exported media.

Resolution Field: Use to set custom resolution values.

Aspect Ratio Field: Select from a list of preset aspect ratios or set your own value.

Bit Depth Field: Use to define the bit depth of exported media.

Scan Mode Field: Use to define the scan mode of exported media.

Resize Options: Use to define the Fit Method, Resize Filter type, the Precision and the Crispness/Softness of the exported media.

Fit Method Box: Use to select the Fit Method applied to exported media. Options are:

- Fill (the default option)
- Crop Edges
- Letterbox
- Center/Crop

Resize Filter Type Box: Use to select the Resize Filter type applied to exported media. Options are:

- Impulse
- Triangle
- Mitchell
- Bicubic
- Quadratic
- Gaussian
- Shannon
- Lanczos

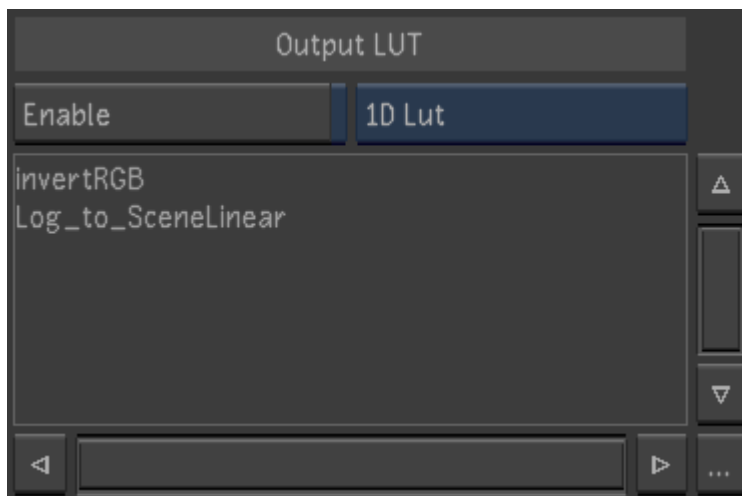
Aspect Button: Enable to use non-square pixel formats. This option is automatically enabled when Fit Method is set to Crop Edges or Letterbox.

Precision Field: Use to set the frequency cut-off point used during the Resize.

Crisp/Soft Field: Use to set the amount of blur used during the Resize.

The LUT Options Tab

Use the Render / Export / LUT Options menu to apply a LUT or colour transform to exported media.



Enable: Apply the selected LUT or colour transform when exporting.

Output LUT type: Select 1D LUT, 3D LUT, or Colour Transform.

Output LUT list: Select a LUT or colour transform to apply to exported media.

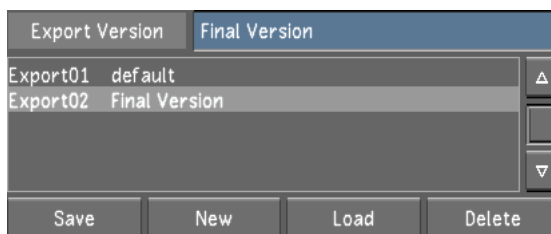
Browse (...) button: Press to open the file browser to navigate to a LUT or colour transform file.

NOTE The Wiretap Gateway supports Flame-compatible 1D and 3D LUT files only. Lustre-compatible 1D and 3D LUT files are not supported.

Export Versions

Export Versions contain all the data required to define an export job and are stored alongside the grade metadata files.

You can create, update, load and delete Export Versions.



To Create an Export Version

- 1 Define your export settings in the Export tabs.
- 2 Type a comment to identify your Export Version in the Export Version Comment field.
- 3 Click New.

Your Export Version is saved and displayed in the Export Version List.

To Load an Export Version

- 1 Select the Export Version you want to load from the list.
- 2 Click Load.

Your Export Version is loaded and the export settings are updated.

To Update an Export Version

- 1 Make sure the Export Version you want to update is loaded.
- 2 Modify the parameters as needed.
- 3 Click Save.

The Export Version is updated.

To Delete an Export Version

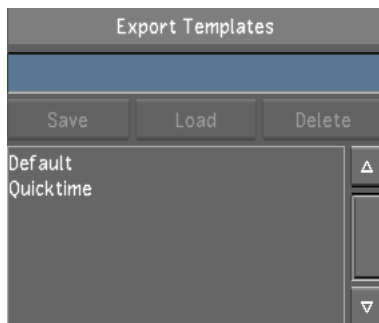
- 1 Make sure the Export Version you want to delete is loaded.
- 2 Click Delete.

Your Export Version is deleted.

Using Export Templates

Use templates to automatically define one or multiple export versions. If for a given project you need to consistently provide the same file types, use Templates to easily create the required versions. You can create, update, load and delete Export Templates.

Export Templates contain one or more Export Versions. When you load an Export Template, the Export Versions contained within the template are appended to the currently displayed Export Versions. If you wish to overwrite the currently displayed Export Versions when you load your template, press the Alt key when clicking the Load button.



To Create an Export Template

- 1 Make sure you have saved at least one Export Version.
- 2 Type a name to identify your Export Template in the Export Template Name field.
- 3 Click Save.

Your Export Template is saved and is displayed in the Export Template List.

To Load an Export Template (Append)

- 1 Select the Export Template you want to load from the list.
- 2 Click Load.

Your Export Template is loaded and the Export Version list is updated.

To Load an Export Template (Overwrite)

- 1 Select the Export Template you want to load from the list.
- 2 Hold the Alt key.
- 3 Click Load.

Your Export Template is loaded and the Export Version list is updated.

To Update an Export Template

- 1 Make sure the Export Template you wish to update is loaded.
- 2 Modify the export parameters and save one or more new Export Versions.
- 3 Click Save.

The Export Template is updated to contain the new Export Versions.

To Delete an Export Template

- 1 Make sure the Export Template you wish to delete is loaded.
- 2 Click Delete.

Your Export Template is deleted.

Preset Export Templates

You can also choose from a list of preset export templates to use for the following applications and devices:

- Avid® Media Composer® software
- Apple® Final Cut Pro® application
- Adobe® Flash®
- Apple® iPod®
- Apple® iPad®
- Apple® iPad® 2
- Apple® iPhone®
- Apple® iPhone® 4
- Apple® iPhone® 4S
- Apple® iPod® Touch
- Apple® TV
- Apple® TV 2
- Blu-ray™
- BlackBerry® PlayBook™ tablet
- DivX®
- Microsoft® Silverlight®

Preset Export Template:	File Size Estimate (30 second clip with two audio tracks at 23.97 fps):
Apple_FinalCutpro_1080p_online	431M
Apple_FinalCutpro_1080p_online_444	906M
Apple_FinalCutpro_1080p_online_HQ	614M
Apple_FinalCutpro_1080p_online_HQ	210M
Apple_FinalCutpro_720p_online_444	462M
Apple_FinalCutpro_720p_online_HQ	319M
Apple_FinalCutpro_960p_offline	123M
Adobe_Flash_320x240_300Kbits	2.7M
Adobe_Flash_640x480_670Kbits	4.0M
Apple_iPad_1024x576_1_8Mbits	13M
Apple_iPad_1280x720_1_8Mbits	13M
Apple_iPhone_640x480_1_5Mbits	5.1M
Apple_iPod_320x240_600Kbits	3.7M
Apple_iPod_640x480_970Kbits	5.1M
Apple_TV_1280x720_4_5Mbits	13M
AVC_HD_1920x1080_20Mbits	76M
AVC_Intra_1440x1080_54Mbits	166M
AVC_Intra_1920x1080_111Mbits	330M
Avid_MediaComposer_1080p_offline	141M
Avid_MediaComposer_1080p_online_10bit	648M
Avid_MediaComposer_1080p_online	648M

Preset Export Template:	File Size Estimate (30 second clip with two audio tracks at 23.97 fps):
Avid_MediaComposer_720p_offline	220M
Avid_MediaComposer_720p_online	333M
Avid_MediaComposer_720p_online	333M
BlackBerry_PlayBook_1920x1080_12Mbps	11M
BlackBerry_PlayBook_1920x1080_20Mbps	11M
BlackBerry_PlayBook_1920x1080_4Mbps	11M
Divx_1920x1080_2Mbps	77M
HDTV_1080i_10Mbps	38M
HDTV_720p_8Mbps	35M

Export Workflows

Example workflows used with the Background Media Export feature in Lustre 2013.

Final Project Delivery Workflow

When your project is finished and ready to be digitally delivered, you can use the following workflow.

- 1 Render your project in One Sequence mode.
- 2 In the Render/Export menu, create a new Export version. **See** [Export Versions](#) (page 631).
- 3 Set the Media Origin field to One Sequence Renders.
- 4 Set the Region field to Scene to export all shots.
- 5 If the sequence has audio media and that you want to be included in the export, enable the Video & Audio option.
- 6 Set the Video File Format and the Compression type or select a profile, if available.
- 7 If the Media Origin field is set to Audio & Video, set the Audio File Format and Compression type.
- 8 Define the File Name using tokens or an actual alphanumeric filename.
- 9 Define the Export Destination.
- 10 Save your Export Version.
- 11 Click Export.

The Export process is started and the resulting media - in this case one file sequence, with audio if selected - will be saved at your defined destination.

If the grade is not rendered before you click Export, Lustre warns you and automatically starts the render, and then the export.

If your workstation is setup with a Burn configuration, you can now send Media Export jobs without first having to render your grades in the foreground. Both processes take place in the background. After the grades are rendered, the Media Export jobs start. This allows you to send multiple jobs for Media Export without having to wait for foreground grade rendering. See [Remote Rendering with Burn and Wiretap](#) (page 610).

If you need to deliver the same grade in other file formats, create a new Export Version and define the various parameters for the chosen file format.

If you want to export multiple versions, enable the Export All Versions option and press Export.

Production Dailies for Editorial Workflow

When working with digitally acquired content like RED and ARRIRAW, post facilities are often asked to deliver graded production material to Editorial, often in various file formats. The following workflow can accommodate this situation.

- 1 Import the source clips you need to grade.
- 2 Create a new Cut and a new Grade.
- 3 Grade the content.
- 4 In the Render/Export menu, create a new Export version. **See** [Export Versions](#) (page 631).
- 5 Set the Media Origin field to Source Grade Renders.
- 6 Set the Region field to Scene to export all shots.
- 7 If the sequence has audio media and that you want to be included in the export, enable the Video & Audio option.
- 8 Set the Video File Format and the Compression type or select a profile, if available.
- 9 If the Media Origin field is set to Audio & Video, set the Audio File Format and Compression type.
- 10 Define the File Name using tokens or an actual alphanumeric file name.
- 11 Define the Export Destination.
- 12 Save your Export Version.
- 13 Press Export.

The Export process is started and the resulting media - in this case the individual source clips that comprise your sequence, with audio if selected - will be saved at your defined destination.

If the grade is not rendered before you click Export, Lustre warns you and automatically starts the render, and then the export.

If you need to deliver the same grade in other file formats, create a new Export Version and define the various parameters for the chosen file format.

If you want to export multiple versions, enable the Export All Versions option and press Export

Media Conversion Workflow

When you need to deliver media files of a given format into another one, with or without audio, the following workflow can accommodate this situation.

This workflow is similar to the Production Dailies for Editorial workflow but does not require media rendering since the exported media is not graded. Only the original media is exported.

The steps are identical to the Production Dailies for Editorial workflow except that you need to set the Media Origin to Original Media.

Stand-Alone Wiretap Gateway Server Configuration for Media Encoding

To use a stand-alone Linux or Mac OSX remote Wiretap Gateway server for media encoding, follow the instructions below.

- 1 Install Backburner 2013.
 - Add the name of your Backburner Manager in `/opt/Autodesk/backburner/cfg/manager.host`. In most cases, the Backburner Manager to use is the one installed on your creative workstation.
 - Restart Backburner manager.
- 2 Install Wiretap Gateway 2013.
- 3 Restart the Wiretap Gateway Server.

Video Capture and Video Playout

28

playing out:video, overviewcapturing:video, overviewvideo:capture and playout, overviewDuring the colour grading process, you may need to capture or playout video and audio from, or record to, an external device, such as a VTR.

For example, you may receive an edited HD or SD video tape to grade with Lustre. Or, you may be given raw footage on video tapes and an EDL to auto-conform in Lustre, and then colour grade.

During capture, the files are created on-the-fly and are available after capturing is completed.

NOTE When capturing video from an HD or SD tape and converting to a DPX file, Lustre writes the SMPTE timecode to the DPX header. Once captured, the timecode appears as part of the DPX file information and is available for use in EDL assembly.

After grading a scene, you play it out to a VTR for client approval or for final delivery on HD or SD tapes.

NOTE The availability of SDI video rasters, which are required to control a VTR, depends on the type of license you have purchased. Contact Customer Support for details.

But before you can capture from, or play out to, an external device, you set up options such as the capture path, file type, and video resolution, as well as options for transferring shots between Lustre and a VTR.

About Audio Tracks

When capturing and recording, you can transfer one video track and up to 16 audio tracks (eight tracks of DVS/AJA AES audio, or 16 tracks of embedded AJA audio). In Lustre, audio tracks are identified as A1 through A16. You can select non-consecutive tracks (for example, you can select tracks A1, A5, and A8).

You can capture, playback, and play out audio in two different ways:

- Audio embedded with video, coming from or going to the SDI connectors ('Embedded' option)
- Audio going through XLR cables from or to the DVS or AJA breakout box ('AES' option)

For more information on capturing, playing back, and playing out audio, see [Audio](#) (page 683).

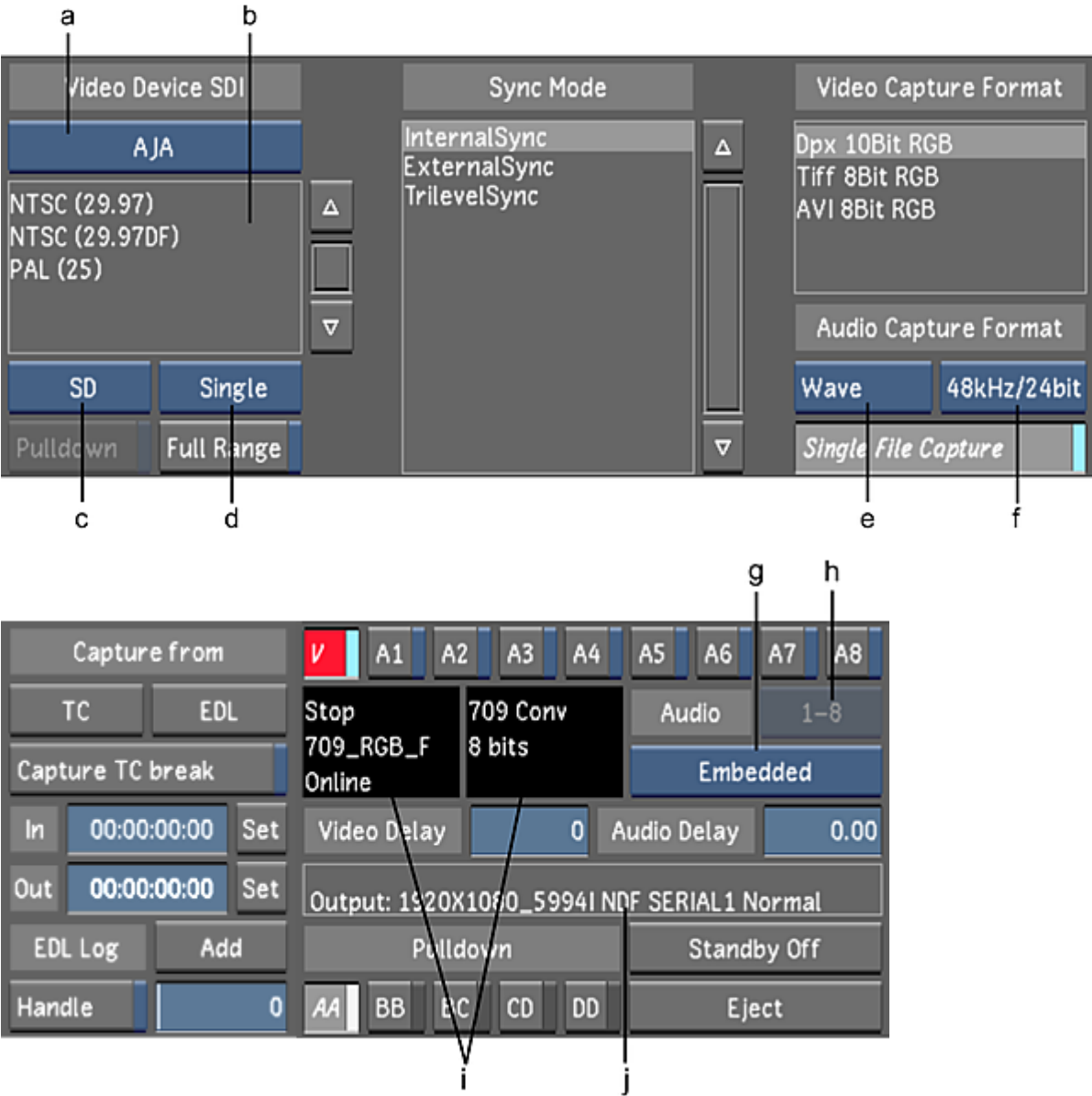
Capture Menu Options

Use the Capture menu to perform your VTR capture operations.

NOTE Capture can only be done using the DVS or AJA video cards. The GFX/SDI options listed below are provided as reference only and should not be used during the capture.

In order to perform VTR capture operations, you must enable the VTR Control button, in the Editing / Playout menu.

The following three graphics represent the Capture menu.



Naming	
Home	C:\Footage\New\Projects\Project
Scene	scene01
Capture	capture
Tape	<TAPE>
Resolution	<RES>
File	<NUM7>.dpx

(a) Video/Graphics option box (b) Raster list (c) Format option box (d) Link Type option box (e) Audio File Type option box (f) Sampling Rate/Bit Depth option box (g) Audio Input button (h) Audio Track Selection option box (i) VTR Status panel (j) Capture Error status

Video/Graphics option box Toggle between the video card (AJA or DVS) and the graphics card (GFX/SDI). The Raster list is then populated with rasters for the selected card.

WARNING When capturing, do not select a raster for the GFX/SDI card. Doing so is not supported and can result in failed capture.

Raster list With a video card selected in the Video option box (AVIO), select one of the listed rasters to set the resolution and timing for capture.

Format option box Toggle to display only rasters belonging to a particular footage format in the Raster list.

Select:	To display:
SD	Standard definition rasters.
HD	High definition rasters.
Film	Film rasters.
Audio	Audio rasters (only applicable to GFX/SDI).

NOTE Enable an Audio Only raster when monitoring the GFX/SDI output and working with audio signal coming out of the AJA/DVS breakout box. This is similar to working with audio media or to using the LTC chase feature with a DVS.

Link Type option box Toggle to display only rasters belonging to a particular link type in the Raster list.

Select:	To display:
Single	The single link rasters.
Dual	The dual link rasters.

Select:	To display:
Stereo	The stereoscopy rasters (only applicable to GFX / SDI).

Pulldown button Enable to remove 3:2 pulldown from Film-to-video transferred material. See [Removing Pulldown when Capturing](#) (page 647).

Full Range button Enable to configure Lustre to capture the full video signal from the video board. If disabled, Lustre captures only the legal portion of the video signal.

Sync Mode list Select one of the sync modes.

Select:	To:
InternalSync	Set the sync mode to a free running internal sync (SD and HD).
ExternalSync	Genlock to an analog sync connected to the sync input (SD only).
TrilevelSync	Genlock to a trilevel sync connected to the sync input (HD only).

Video Capture Format list Select a video capture format to set file type, colour space, and bit depth of the captured material.

Select:	To capture only:
Dpx 10Bit RGB	DPX files with an RGB colour space at a bit depth of 10-bit.
Tiff 8Bit RGB	TIFF files with an RGB colour space at a bit depth of 8-bit.
AVI 8Bit RGB	AVI files with an RGB colour space at a bit depth of 8-bit (available only on Windows workstations.)

Audio File Type option box Choose whether to save audio captured from a VTR/ATR, or imported from Wiretap as a Wave (.WAV) or AIFF (.AIF) file.

Audio Sampling Rate/Bit Depth option box Select to capture the audio tracks at a sampling rate of 48 kilohertz (kHz) and a bit depth of 16-bit, or 48 kHz and a bit depth of 24-bit.

Single File Capture button When enabled, all the selected audio tracks are saved in a single file. When disabled, each audio track is saved as an individual file. This option is enabled by default.

Log panel Displays status messages during capture.

TC button Initiates a capture from VTR using timecode in and out points. See [Capturing from Timecode](#) (page 648).

EDL button Initiates a capture from VTR using an EDL. See [Auto-conforming an EDL](#) (page 654).

NOTE EDL Capture is video only; audio events are ignored.

Capture TC Break button Initiates a capture from VTR using the timecode in and out points, regardless of the number of timecode breaks. See [Capturing Media with Timecode Breaks](#) (page 651).

Timecode In Point field Enter the start timecode. Press Set next to the field to set the current timecode (read from the VTR) as the in point.

Timecode Out Point field Enter the end timecode. Press Set next to the field to set the current timecode (read from the VTR) as the out point.

EDL Log Add button Logs the In and Out timecode points as an EDL for capture. See [Logging and Batch Digitizing](#) (page 652).

NOTE Only video events are supported for EDL logging.

Handle button Enable to capture heads and tails. This feature is used when capturing from an EDL or from timecode.

NOTE You must enable the Handle button in order to use the Handle slider.

Handle slider Set the number of head and tail frames to capture.

V button Enable to capture the video track when capturing from a video source. Disable to capture audio only.

A1 - A16 buttons Enable the audio track(s) (A1-A16) to capture from an audio source.

VTR Status panel Displays the VTR status messages when Lustre is connected to a VTR.

Audio Track Selection option box Used in correlation with the A1-A16 buttons. Toggle to determine whether tracks 1-8 or 9-16 are visible. Tracks 9-16 are only available with embedded AJA audio. If only eight audio tracks are available, this option is disabled (greyed out).

Audio Input option box Toggle to specify the source of the captured audio.

Select:	To specify the connection to the audio source:
Embedded	The SDI connection.
AES	The XLR connections on the DVS/AJA breakout box.

Video Delay field Enter a frame number to delay the video capture for that number of fields. For example, if you set the field to 10, the capture begins 10 frames after the In point. If you set the field to -10, capture begins 10 frames before the In point.

Audio Delay field Enter a frame number to delay the audio capture for that number of fields. For example, if you set the field to 10, the audio capture begins 10 frames after the In point.

NOTE The Video and Audio Delay fields compensate for the frame delays that may exist when capturing to Lustre.

Capture Error status Displays a message when an error has occurred while capturing from a VTR.

Pulldown Field buttons Enable a Pulldown Field button to select the frame used for the 3:2 pulldown. Only available when Pulldown is enabled. See [About 3:2 Pulldown](#) (page 678).

Standby Off button Removes the VTR heads from the tape.

Eject button Ejects the tape in the VTR.

Home field Displays the project home directory. This is the destination path for captured footage. You cannot change this value without modifying your project settings.

Scene field Displays the current scene you are working in during capture. You cannot change this value without modifying your project settings.

Capture field Enter the name of the folder where video media is saved.

Tape field Displays the tape name. When capturing in TC mode, enter a tape name. When capturing from an EDL, the default tape name is determined by that EDL. If you capture an EDL with multiple tapes, a folder structure (<tape>/<resolution>/) is created for each tape (e.g., 0001/1920x1080).

Resolution field Defaults to the resolution of the captured files, and is used in the folder structure. Do not change this field.

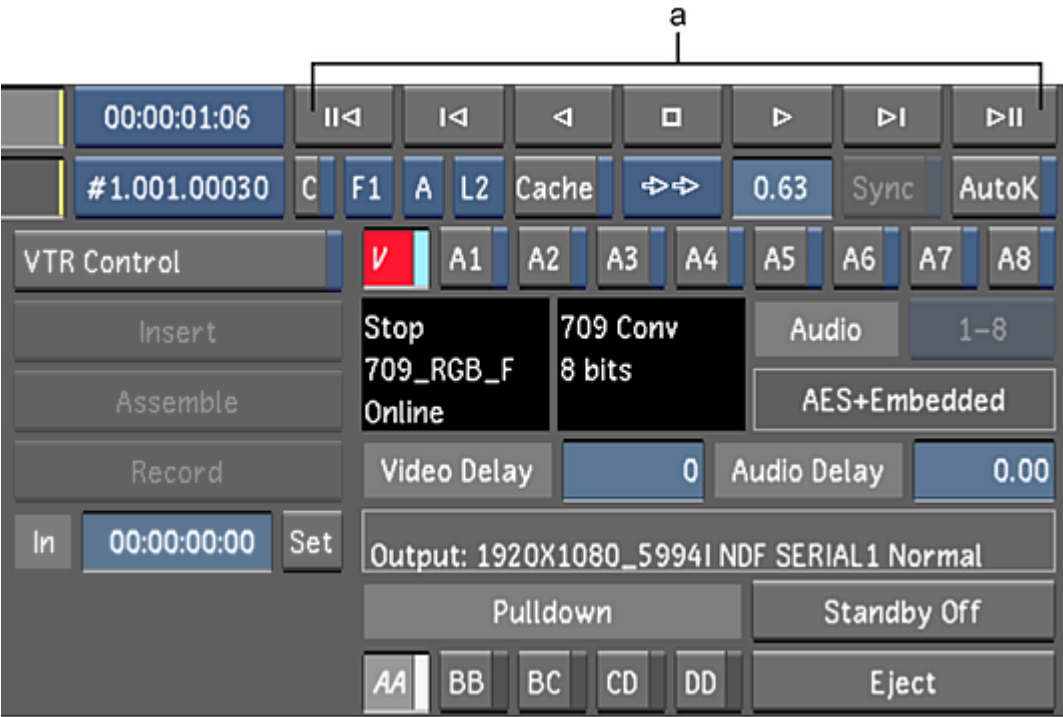
File field Displays the filename, which is the frame offset value based on the source timecode (e.g., 84600.dpx is 1:00:00:00 at 24 fps). <NUM7> defines the amount of padding for the file name (for example, 084600.dpx reflects six digits of padding before the extension). You can add a prefix before the <NUM7> number, but to ensure consistent frame counting, do not erase the <NUM7> number (e.g., Mymovietitle.084600.dpx).

Controlling the VTR

controlling:VTRVTR:controlling for video I/OWhen working with a VTR, you can use the VTR transport controls to play through the video tape and locate your footage. As you find your footage, you can capture it immediately, or add shots to a list that you can batch digitize all at once.

You can also use the transport controls to cue up a VTR to the record in point when playing out to the VTR.

To control the VTR, don't forget to enable the VTR Control button, in the Editing / Playout menu.



(a) VTR transport controls

NOTE To control the VTR remotely, you must connect a 9-pin RS-422 cable between the VTR and Lustre. For information, refer to the *Autodesk Lustre Software Installation Guide* for your platform.

To control the VTR:

- 1 Do one of the following:
 - If performing capture operations in the Capture menu, click the Source Timecode field. The capture controls turn blue to indicate that you can use them as VTR transport controls.

- If performing playout operations in the Playout menu, click the Source Timecode field. The playback controls turn blue to indicate that you can use them as VTR transport controls.

NOTE In the Playout menu, you can toggle between the timeline and VTR by clicking on the Source Timecode field. If the Source Timecode field is blue, the controls can be used as VTR transport controls. If the controls are white, they are timeline controls.



(a) Source Timecode field

The transport controls are as follows.

Click:	To:
	Fast rewind.
	Cue to TC In. Right-click to jog back one frame.
	Play in reverse.
	Stop the VTR.
	Play forward.
	Cue to TC Out. Right-click to jog ahead one frame.
	Fast forward.

- 2 To eject the tape in the VTR, click Eject in the Capture menu.

NOTE You can also control the VTR from the Playout menu. See [Playing Out to a VTR](#) (page 662).

Capturing Material

VTR:capturing fromcapturing:from a VTRUse the Capture menu to digitize material from an external source. You can digitize in any one of the following ways:

- Digitize one event at a time by capturing from timecode values. See [Capturing from Timecode](#) (page 648).
- Digitize events from an external source that has various timecode breaks. See [Capturing Media with Timecode Breaks](#) (page 651).
- Batch digitize from a Log file. See [Logging and Batch Digitizing](#) (page 652).
- Batch digitize from an imported EDL. See [Auto-conforming an EDL](#) (page 654).
- Perform a live capture from non-controlled sources. See [Performing a Live Capture from a Non-Controlled Source](#) (page 657).

For certain video formats, you can remove pulldown when capturing. See [Removing Pulldown when Capturing](#) (page 647).

In order to perform VTR capture operations, don't forget to enable the VTR Control button, in the Editing / Playout menu.

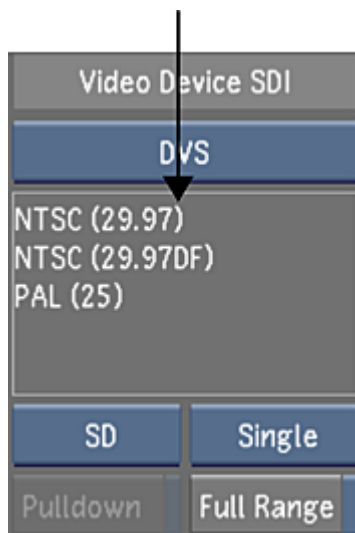
Selecting a Raster for Capture

Whenever capturing material, you must select a raster.

NOTE When you select a drop frame (DF) video format, the timecodes are calculated in Drop Frame mode.

To select a raster for capture:

- 1 In the Video Device SDI group, toggle the Video/Graphics option box to display your video card (AVIO). See [Capture Menu Options](#) (page 639).
- 2 Select an option from the Link Type box. Select Single for a 4:2:2 video signal, and Dual for a 4:4:4 video signal.
- 3 Toggle the Format option box to the required raster format (SD, HD, Film, or Audio).
- 4 In the Raster list, select the raster that matches the material to capture.



NOTE If clicking on a raster in the Raster list does not select the item, that format is not available for capture on that system.

- 5 (Optional) Remove 3:2 pulldown frames on capture. See [Removing Pulldown when Capturing](#) (page 647).

Removing Pulldown when Capturing

pull-down:removing for capturecapturing:removing pull-downDepending on the type of source material you are working from, you may need to remove 3:2 pulldown frames at capture time. For more information about 3:2 pulldown, see [About 3:2 Pulldown](#) (page 678).

NOTE Inconstant cadence material (i.e., re-edited material) may produce jittery results.

To remove 3:2 pulldown during capture:

- 1 Click Pulldown.
- 2 Use the VTR to shuttle to the first frame you want to capture.



(a) Pulldown Field buttons

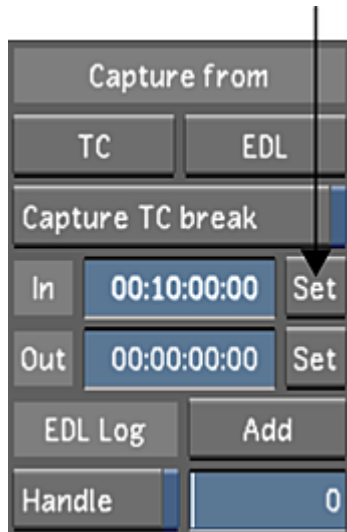
- 3 Enable the Pulldown Field button that matches the field composition of that frame.

Setting In and Out Points

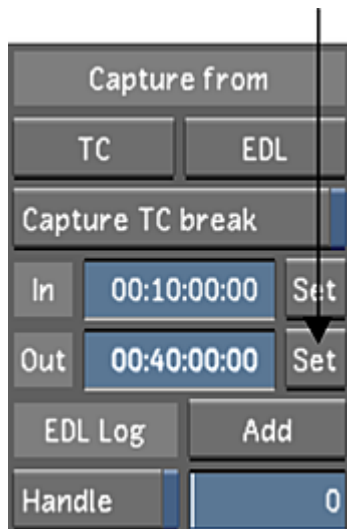
You can set in and out points to select the material to capture from an external video source.

To set in and out points:

- 1 Set the in point. Use one of the following techniques:
 - Enter the in point timecode by typing the value directly in the In field.
 - Navigate to the in point using the VTR transport controls, and then, in the Capture from group, click Set next to the In field.



- 2 Set the out point. Use one of the following techniques:
 - Enter the out point timecode by typing the value directly in the Out field.
 - Use the VTR transport controls to navigate to the out point, and then, in the Capture from group, click Set next to the Out field.



Capturing from Timecode

video:capturing from timecodecapturing:from timecodeIn capturing from timecode mode, you capture one shot by marking the length of the shot with in and out timecode values. You can either enter the timecode

values manually or scrub the VTR to the in and out points. You also have the option of capturing video only, audio only, or audio along with the video.

To capture from timecode:

- 1 Click Editing, and then click Capture.
The Capture menu appears.
- 2 In the Naming group, enter values in Capture and Tape. See [Capture Menu Options](#) (page 639).

Naming	
Home	C:\Footage\New\Projects\Project
Scene	scene01
Capture	capture
Tape	<TAPE>
Resolution	<RES>
File	<NUM7>.dpx

- 3 Select a raster for capture. See [Selecting a Raster for Capture](#) (page 646).
- 4 In the Sync Mode list, select a synchronization option. See [Capture Menu Options](#) (page 639).
- 5 In the Video Capture Format list, select a file format. See [Capture Menu Options](#) (page 639).

Video Capture Format	
Dpx 10Bit RGB	
Tiff 8Bit RGB	
AVI 8Bit RGB	

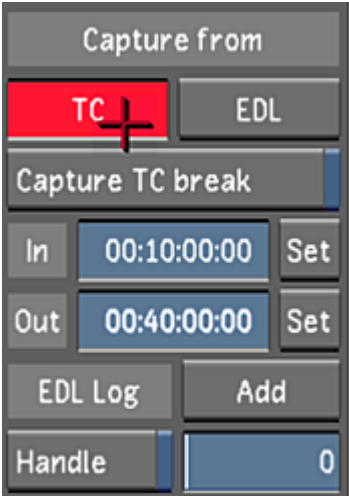
Audio Capture Format	
Wave	48kHz/24bit

Single File Capture

NOTE The AVI format is only available on Windows workstations.

- 6 Select the audio file type, bit depth, and determine if you want to capture the audio tracks as a single or multiple files. Single File Capture is enabled by default. For more information about capturing audio, see [Capturing an Audio File](#) (page 686).
- 7 (Optional) Set video and audio capture delays. See [Capture Menu Options](#) (page 639).
- 8 Select the video and audio tracks to capture. See [Capture Menu Options](#) (page 639).
- 9 Set the in and out points. See [Setting In and Out Points](#) (page 647).

- 10 In the Capture from group, click TC. When the button turns red, click it again to confirm the action.



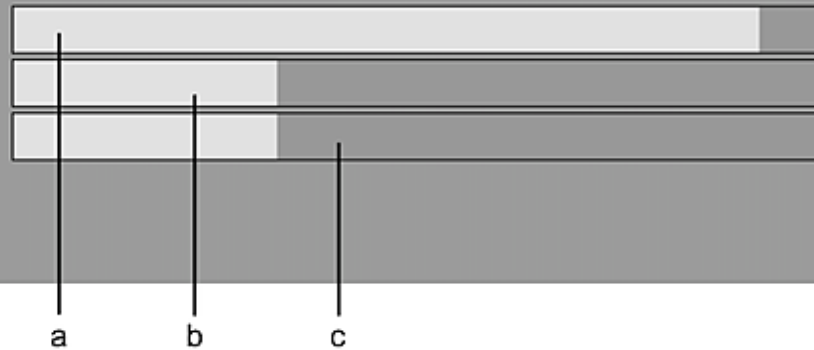
The capture starts. The VTR shuttles back to the in point and begins capturing. The VTR's current timecode and remaining timecode are displayed in a field located to the left of the playback controls. While capturing, both timecodes update and appear in red.



(a) VTR timecode remaining (b) Current VTR timecode

During capture, the message “Capturing from tape...” appears in the Player, and progress bars display shot, tape, and overall progress. There is no video displayed in the Player during capture.

Capturing from tape...



(a) Shot progress (b) Tape progress (c) Overall progress

- 11 (Optional) To pause the capture process to access additional capture options, press `ESC`, and then do one of the following:
- Press `ESC` to abort the capture.
 - Press `E` to restart the capture.
 - Press `S` to skip the current tape.

Capturing Media with Timecode Breaks

video:capturing with timecode breakscapturing:with timecode breaksThe Capture with Timecode Breaks feature allows you to capture all the content of a tape, regardless of the number of timecode breaks. When you use this option, Lustre begins capturing from the given in point until the duration point has been reached. A file sequence is created for each continuous timecode section.

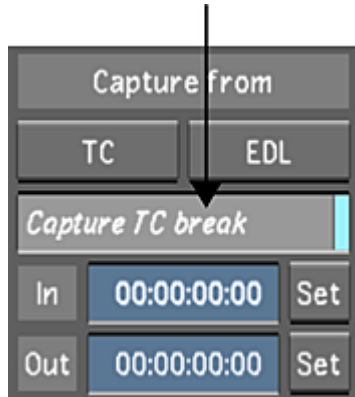
To use this feature properly, you need to make sure you are entering the correct values for the in and out point. The in point is the source timecode of where you want the capture to begin. In the following procedure, the in point is set at 10:00:00:00 (as an example). The out point is used to compute the duration of capture. In the procedure, the out point is set at 10:10:00:00. This represents that ten minutes of footage will be captured, regardless of the number of timecode breaks within this time frame.

NOTE The pulldown removal option and audio capture feature are not supported when capturing with timecode breaks.

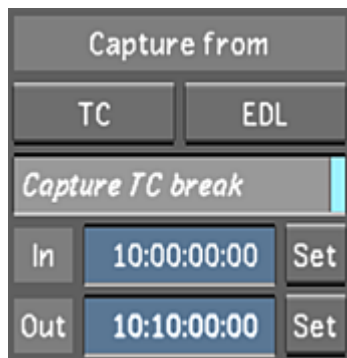
To capture media that contains timecode breaks:

- 1 Click Editing, and then click Capture to display the Capture menu.

- 2 Enable the Capture TC break button.



- 3 Make sure the video track button is enabled.
- 4 In the timecode in point field, enter the point of where you want the capture to begin (e.g., 10:00:00:00).
- 5 In the timecode out point field, enter a timecode that is used to compute the duration of the capture (e.g., 10:10:00:00, to represent ten minutes of capture).



- 6 Click TC. When the button turns red, click it again to confirm the action. The capture starts.

Logging and Batch Digitizing

batch, digitizingcapturing:from a batch listYou can log shots and batch digitize them. To do this, you shuttle through the tape, mark in and out points that correspond to the sections you want to digitize, and then add those sections to a list of shots to digitize all at once.

NOTE This operation only logs and captures video.

To batch digitize shots from a video tape:

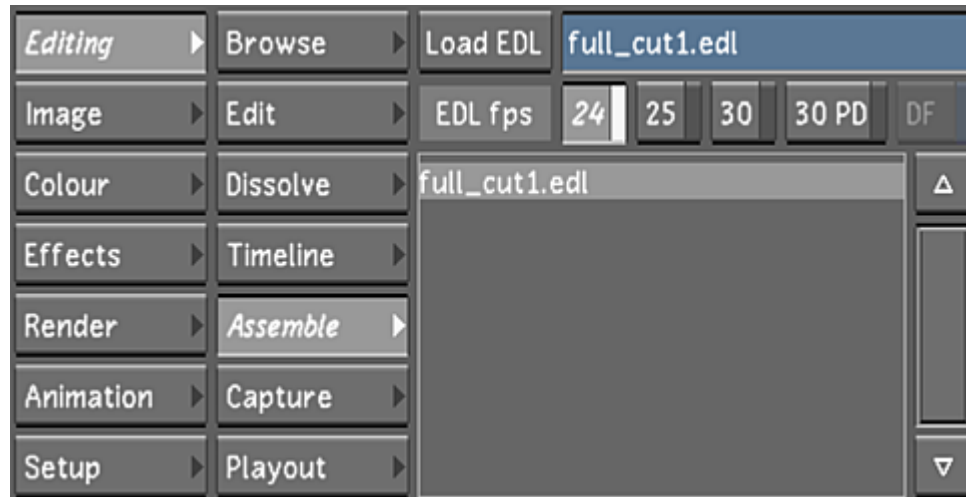
- 1 Click Editing, and then click Capture.
The Capture menu appears.
- 2 Select a raster for capture. See [Selecting a Raster for Capture](#) (page 646).
- 3 In the Video Capture Format list, select the file format that you want to create during the capture operation.
- 4 In the Naming group, enter values in the Capture and Tape fields. See [Capture Menu Options](#) (page 639).

WARNING It is important that you enter a tape name to avoid overwriting previously captured files.

- 5 Set the in and out points. See [Setting In and Out Points](#) (page 647).
- 6 In the EDL Log group, click Add to add the selected material to the events list.



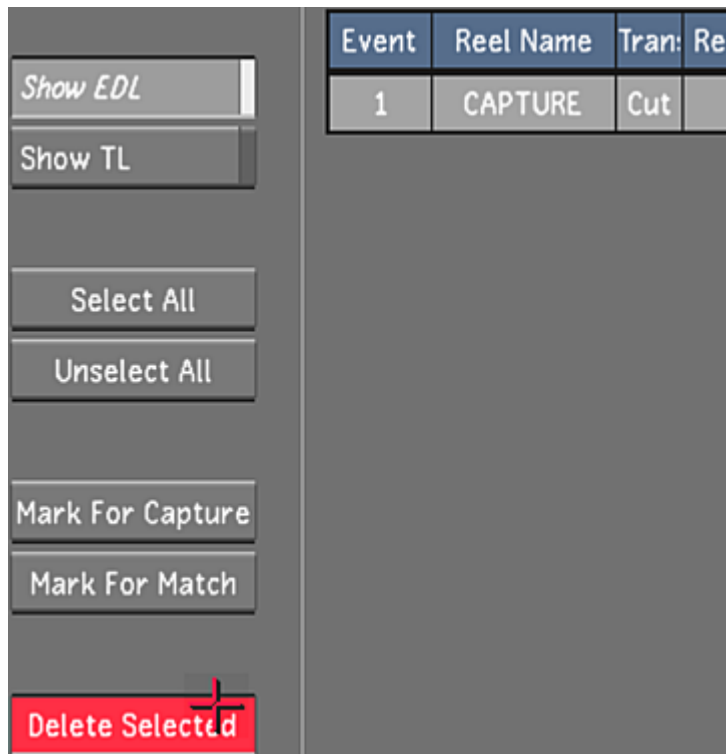
- 7 To view the events list, click Editing, and then Assemble.



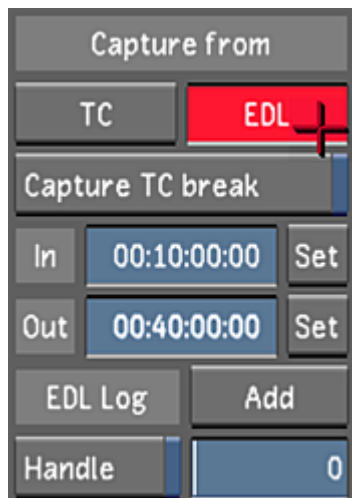
You need to mark the captures before returning to the Capture menu: click in the Event column to select an entry, or click Select All, and then click Mark for Capture. The entries marked for batch digitization appear in the Assemble menu.

Event	Reel Name	Trans	Retime	Source In	Source Out	Record In	Record Out
1	CAPTURE	Cut		00:00:00:00	00:00:00:00	00:00:00:00	00:00:00:00

- 8 Continue adding entries to the events list as needed.
- 9 (Optional) To delete an entry from the events list, select it from the Assemble window and click Delete Selected. Click it a second time to confirm the action. To clear the list, click Delete All.



- 10 When you are ready to digitize, return to the Capture menu.
- 11 In the Capture from group, click EDL once and then confirm the action by clicking EDL a second time.



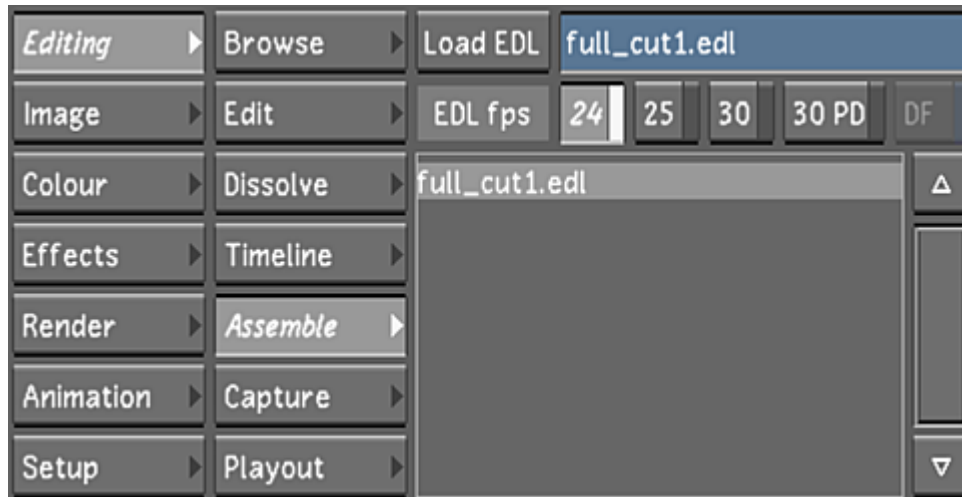
Auto-conforming an EDL

Cutlist files:auto-conformingALE files:auto-conformingEDL files:auto-conformingcapturing:from an EDL, ALE or Cutlist fileYou can automatically digitize material using instructions contained in an EDL, and then assemble the digitized events into a cut which appears in the Storyboard and the timeline.

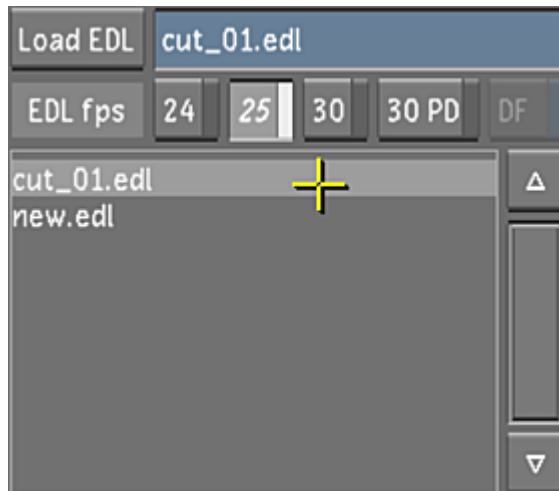
You can batch digitize from an EDL that has been placed in the current scene's Library directory. This directory is located under <HOME>\<scenename>\.

To capture from an EDL:

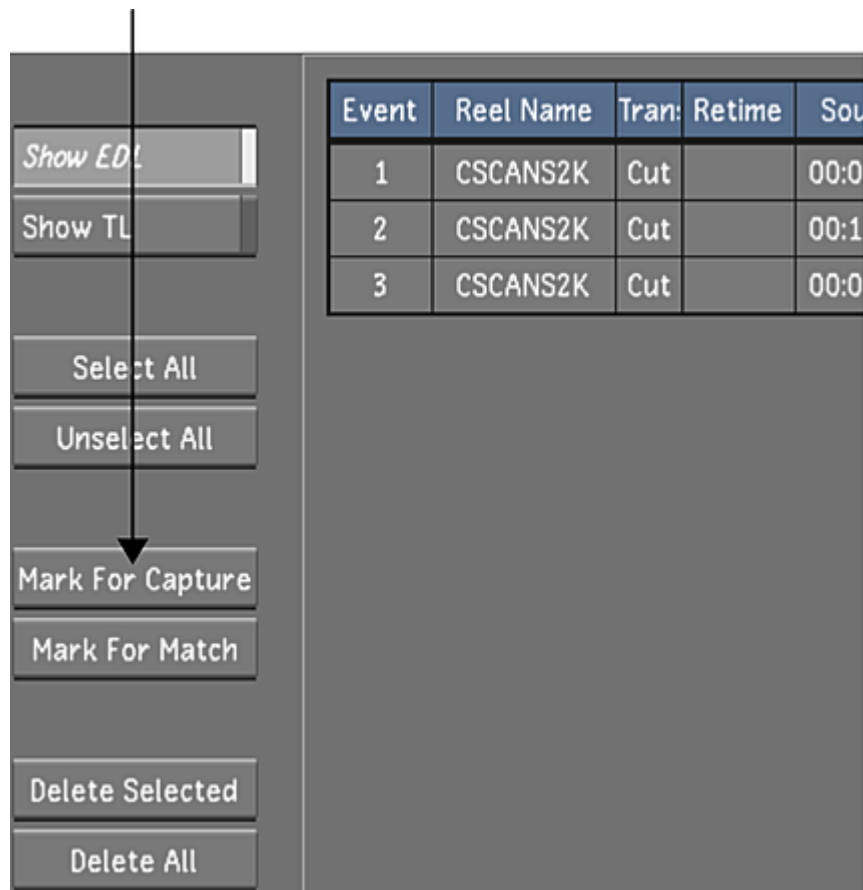
- 1 Make sure your EDL file is in the scene's Library directory.
NOTE If the file is in the wrong location, it will not show up in the EDL list.
- 2 Click Editing, and then click Capture.
- 3 Select a raster for capture. See [Selecting a Raster for Capture](#) (page 646).
- 4 Click Assemble to access the Assemble window.



- 5 Select an EDL file from the EDL list. **Ctrl**-click the EDL list to refresh it.

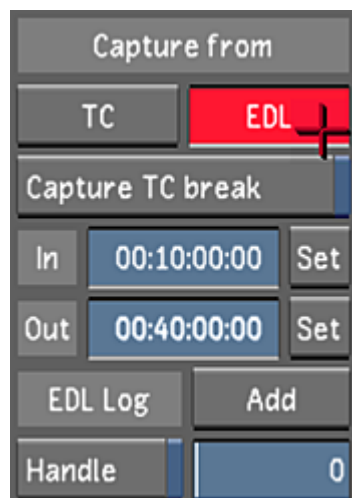


- 6 Click Load EDL to display the EDL contents in the Assemble menu.
- 7 Select individual events to capture (**Ctrl**+click), a group of events (**Shift**+click), or click Select All.
- 8 Click Mark for Capture.



The selected events are marked as Need Capture under the Media column of the EDL events.

- 9 Click Capture.
- 10 In the Video Capture Format list, select the file format that you want to create during the capture operation. See [Capture Menu Options](#) (page 639).
- 11 In the Naming group, enter values in the Capture and Tape fields. See [Capture Menu Options](#) (page 639).
- 12 Click EDL once, and then confirm the action by clicking EDL a second time.



The Capture starts.

- 13 When capture is completed, add the new shots to the Library. See [Loading Clips to the Library](#) (page 212).
- 14 Go back to the Assemble menu and assemble the EDL. See [Assembling an EDL](#) (page 240).
- 15 Click Browse to display the Browse menu.
- 16 Enter the name for the new cut in the Cut name field.
- 17 Click New.

The new cut is saved and named after the captured EDL.

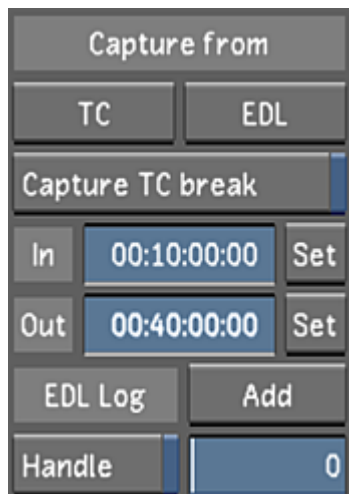
Performing a Live Capture from a Non-Controlled Source

capturing:performing live from non-controlled sourceYou can capture live from any non-controlled source. A non-controlled source is any source with an SDI Out, such as another Lustre workstation, or a Smoke or Flame workstation. For example, you have footage residing on a Flame workstation that you need. You can connect to that workstation and input the footage directly, without going through tape output and input.

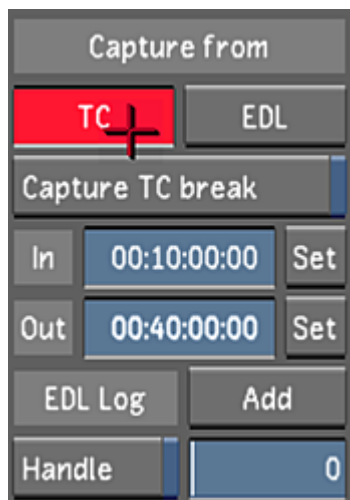
To perform a live capture from a non-controlled source:

- 1 Connect the SDI Out of the non-controlled source to the SDI In on the video card of the Lustre workstation.
- 2 Click Editing, and then click Capture.
- 3 Select a raster for capture. See [Selecting a Raster for Capture](#) (page 646).
- 4 In the Capture from group, enter in and out points in the In and Out fields.

This is done in order to set the duration of the capture. The values can be anything, as long as they reflect the desired duration.



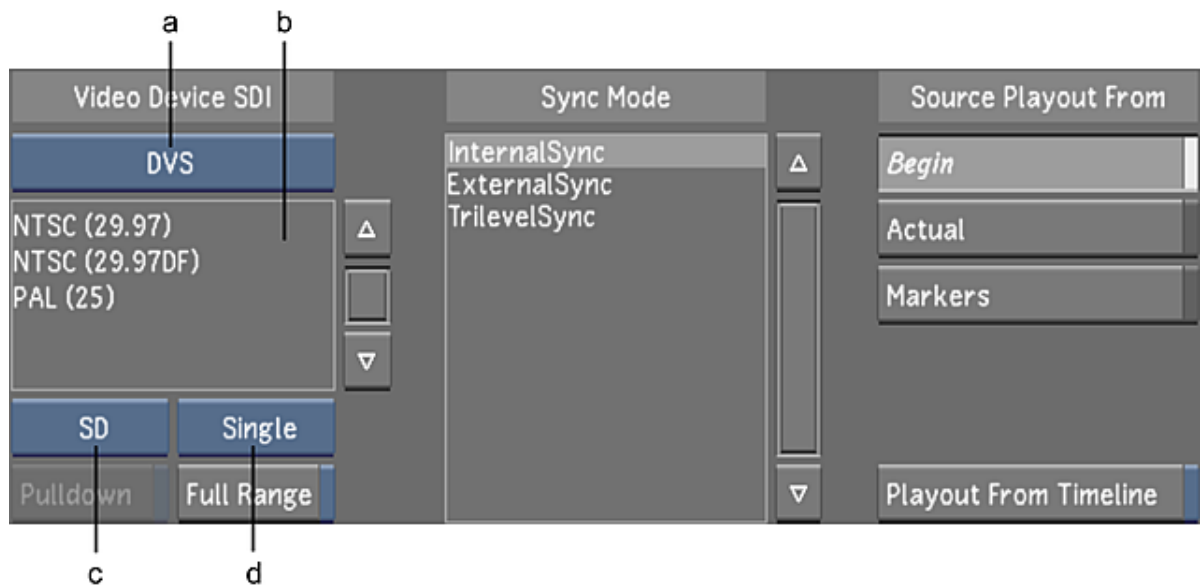
- 5 To start the capture, `Ctrl`+double-click TC.

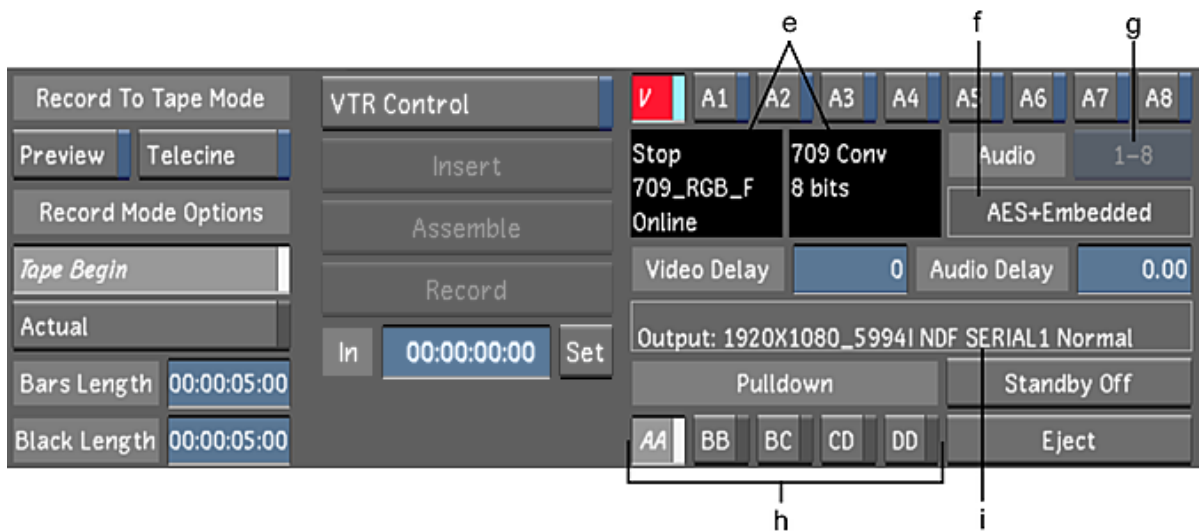


Playout Menu Options

Use the Playout menu to play out media to a VTR.

The following two graphics represent the Playout menu.





(a) Video/Graphics Raster option box (b) Raster list (c) Format option box (d) Link Type option box (e) VTR Status panel (f) Audio Output status (g) Audio Track Selection option box (h) Pulldown Field buttons (i) Playout Error status

In order to play out to VTR, you must enable the VTR Control button in the Editing / Playout menu.

Video/Graphics option box Toggle between the video card (AVIO) and the graphics card (GFX/SDI). The Raster list is then populated with rasters for the selected card.

Raster list With a video card selected in the Video option box (AVIO), select one of the listed rasters to set the resolution and timing for capture.

Format option box Toggle to display only rasters belonging to a particular footage format in the Raster list.

Select:	To display:
SD	Standard definition rasters.
HD	High-definition rasters.
Film	Film rasters.
Audio	Audio rasters (only applicable to GFX/SDI).

Link Type option box Toggle to display only rasters belonging to a particular link type in the Raster list.

Select:	To display:
Single	The single-link (4:2:2 signal) rasters.
Dual	The dual-link (4:4:4 signal) rasters.
Stereo	The stereoscopy rasters (only applicable to GFX/SDI).

Pulldown button Enable to configure Lustre to add a pulldown frame when playing out. See [About 3:2 Pulldown](#) (page 678).

Full Range button Enable to configure Lustre to play out the full video signal from the video board. If disabled, Lustre plays out only the legal portion of the video signal.

Sync Mode list Select one of the sync modes.

Select:	To:
InternalSync	Set the sync mode to a free-running internal sync (SD and HD).
ExternalSync	Genlock to an analog sync connected to the sync input (SD only).
TrilevelSync	Genlock to a trilevel sync connected to the sync input (HD only).

Source Playback From buttons Select a starting point for the playback.

Enable:	To select:
Begin	The start of the timeline as the starting point for playing out to tape.
Actual	The current position of the positioner as the starting point for playing out to tape.
Markers	The marker position as the starting point for playing out to tape.

NOTE Markers are In/Out marks that you can set to define the playback operation. See [Defining In and Out Markers when Playing Out to Tape](#) (page 664).

Playback From Timeline button When enabled it allows you to play out source material containing secondary grading without having to perform a render first. See [Playback from Timeline with GPU Acceleration](#) (page 677).

Record To Tape Mode buttons Allow you to configure Lustre to display what the edited footage would look like without recording to VTR or to play out the current timeline and send the source timecode to the VTR.

Enable:	To:
Preview	Preview the footage that will be recorded without recording to tape.
Telecine	Record the footage to tape along with its original source timecode and black media between shots. See Writing Telecine-Style Tape (page 672).

Record Mode Options buttons Define where on the tape Lustre begins recording when using the Record playback mode. For more information about Record Mode options, see [Playing Out to a VTR](#) (page 662).

Enable:	To begin recording:
Tape Begin	At the beginning of the tape.
Actual	At the position of the current frame on the tape.

Bars Length field Defines the duration (in seconds) of the colour bars recorded to the video tape before the recorded footage begins.

Black Length field Defines the duration (in seconds) of the leader black recorded to the video tape before the recorded footage begins.

Insert button Initiates recording when inserting video and/or audio onto a tape that already contains material.

Assemble button Initiates recording of both video and audio signals on all tracks to a tape when you need to record beyond the point where the valid control track ends.

Record button Initiates recording of both video and audio signals on all tracks when recording an entire cut to tape.

NOTE Use the Record button to write to a new tape with no content. When you record in Record mode, Lustre writes bars and black media before the playback.

In Point field Enter the timecode of the tape where the recording will begin.

NOTE When you configure the in point, the out point is automatically set to the timecode that equals to sum of the clip duration added to the in point.

In Point Set button Sets the current timecode of the tape as the in point.

V button Enable to play out the video track when playing out to a video source. Disable to play out audio only.

A1 - A16 buttons Enable the audio tracks (A1-A16) for playback.

NOTE You can only specify specific video and audio tracks to play out if you are in Insert mode.

VTR Status panel Displays VTR status messages when Lustre is connected to a VTR.

Audio Track Selection option box Used in correlation with the A1-A16 buttons. Toggle to determine whether tracks 1-8 or 9-16 are visible. Tracks 9-16 are only available with embedded AJA audio. If only eight audio tracks are available, this option is disabled (greyed out).

Audio Output status Audio is always outputted to both AES and Embedded audio.

Video Delay field Enter a frame number to delay the video playback for that number of fields. For example, if you set the field to 10, playback begins 10 frames after the in point. If you set the field to -10, playback begins 10 frames before the in point.

Audio Delay field Enter a frame number to delay the audio playback for that number of fields. For example, if you set the field to 10, audio playback begins 10 frames after the in point. If you set the field to -10, audio playback begins 10 frames before the in point.

NOTE The Video and Audio Delay fields compensate for frame delays that may exist while transferring shots from Lustre to the output device.

Playback Error status Displays a message if an error occurs while performing a playback.

Pulldown Field buttons Enable a Pulldown Field button to select the frame used for the 3:2 pulldown. Only available when Pulldown is enabled. See [About 3:2 Pulldown](#) (page 678).

Standby Off button Removes the VTR heads from the tape.

Eject button Ejects the tape in the VTR.

Playing Out to a VTR

VTR:playing out to a VTRUse the Playout tool to play out frames from Lustre so that they can be recorded to an external device.

NOTE If you play out Telecine-style to tape, you can only play out in Assemble mode.

In the majority of cases, you will play out rendered frames to a VTR. See [Rendering Shots](#) (page 591). There are exceptions:

- The creation of real-time deliverables using source material. See [Creating Real-Time Deliverables from the Timeline or Rendered Material](#) (page 673).
- GPU playout from the timeline. See [Playout from Timeline with GPU Acceleration](#) (page 677).

There are three modes for playing out to a VTR:

- In Insert mode, you record video only, audio only, or a combination of both, to a tape that already contains material (either pre-striped with black or actual video material with a valid control track).
- In Assemble mode, you can add video to the end of previously-recorded material.
- In Record mode, you can play out video to a blank tape or a tape that contains existing material. Everything on the tape is overwritten when recording.

NOTE In order to play out to VTR, don't forget to enable the VTR Control button, in the Editing / Playout menu.

For some video formats, you can add 3:2 pulldown during the playout operation. See [About 3:2 Pulldown](#) (page 678).

Playout Workflow

workflows:playoutplaying out:workflowThe recommended steps for playing out video to a VTR are as follows.

Step:	Refer to:
1. Render the timeline in the appropriate resolution for the VTR to which you want to play out.	Rendering Shots (page 591).
2. Enable the VTR Control button, in the Editing / Playout menu.	
3. Use the transport controls to cue up the VTR to the in point.	Controlling the VTR (page 644).
4. (Optional) Cue up the timeline.	Navigating through Shots (page 322).
5. Select a playout mode.	Playing Out to a VTR (page 662).

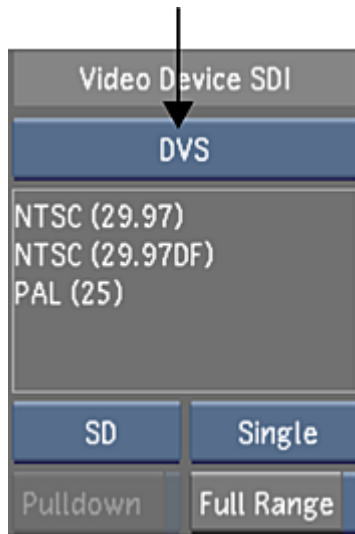
Selecting a Raster for Playout

When playing out to an external device, you must select a raster.

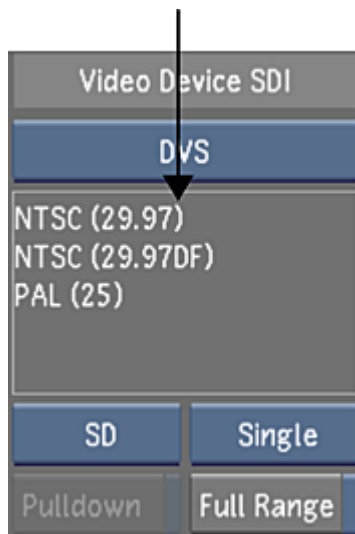
NOTE When you select a drop frame (DF) video format, the timecodes are calculated in Drop Frame mode.

To select a raster for playback:

- 1 In the Video Device SDI group, toggle the Video/Graphics raster option box to display your video card (AVIO). See NO LABEL .



- 2 Select an option from the Link Type box. Select Single for a 4:2:2 video signal, and Dual for a 4:4:4 video signal.
- 3 Toggle the Format option box to the required raster format (SD, HD, Film, or Audio).
- 4 In the Raster list, select the raster for playback.



NOTE If clicking on a raster in the Raster list does not select the item, that format is not available for capture on that system.

- 5 (Optional) If you need to add 3:2 pulldown frames when playing out, enable Pulldown.
The pulldown is added to the played out video. The first frame played out becomes the AA frame in the pulldown sequence.

If you are playing out to a *Dolby Content Mapping Unit*, make sure to:

- Set the Link Type box to Dual.

- Enable RGB 4:4:4.
- Enable 12 bit.
- Enable Full Range.

Defining In and Out Markers when Playing Out to Tape

playing out:defining in and out points whenUsers can create a video tape from a specific segment of the timeline by setting in and out points for playing out to tape. This is done using the same hot keys as for setting in and out points for playing shots in the Player. A new option has been added to the Editing > Payout menu that lets you select the marked section for payout to tape.

To define in and out markers when playing out to tape:

- 1 Go to the start and end frame and mark the in and out points.

Press:	To:
Shift+I	Mark an in point.
Shift+O	Mark an out point.
Shift+L	Clear in and out points.

- 2 Click Editing, and then click Payout to display the Payout menu.
- 3 Click Markers.



NOTE If you enable an in point only, payout begins at that point and goes to the end of the timeline. If you enable an out point only, payout begins at the start of the timeline and ends at the out point.

Recording in Insert Mode

recording:Insert modeplaying out:in Insert modeUse Insert mode when you want to insert video only, audio only, or both video and audio onto a tape that already contains material. The entire area to which you are recording must have a valid, continuous control track, as this mode only plays out the video (existing timecode and audio are not affected).

NOTE When recording to tape, you can only configure specific video and audio tracks to play out if you are in Insert mode.

To record in Insert mode:

- 1 Set the VTR to Regen timecode.
- 2 Before you can play out to a VTR, you must render the timeline at the appropriate video resolution. See [Rendering Shots](#) (page 591) and [Playout Workflow](#) (page 662).
- 3 Click Editing, and then click Playout to display the Playout menu.
- 4 Select a raster for playout. See [Selecting a Raster for Playout](#) (page 662).
- 5 In the Sync Mode list, select the synchronization mode. See [Playout Menu Options](#) (page 658).
- 6 (Optional) To record only a portion of the timeline, use markers to define where, in the timeline, you wish to start and stop recording to tape. See [Defining In and Out Markers when Playing Out to Tape](#) (page 664).
- 7 In the Source Playout From group, determine where the playout operation starts.

Click:	To start the playout:
Begin	From the start of the current timeline.
Actual	At the current frame.
Markers	At the in marker in the timeline, and stop at the out marker.



- 8 In the In field, enter the tape timecode where the video is to be inserted.



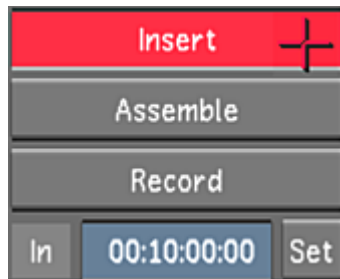
TIP To find the desired timecode more quickly, click the Source Timecode field next to the playback controls while still in the Playout menu. The playback controls and Source Timecode field turns blue to indicate that they can be used to control the VTR. Scrub to the desired timecode, then enter it in the In field.

- 9 (Optional) In the Record To Tape Mode group, enable Preview.



With Preview enabled, your footage is played out in the Player, but nothing is written to tape. The Insert button turns green after the first click to show that the action is non-destructive.

- 10 (Optional) Configure video and audio record delay. See [Playout Menu Options](#) (page 658).
- 11 Configure Lustre to record specific video and audio tracks to tape. See [Playout Menu Options](#) (page 658).
- 12 Click Insert, and then click it again to confirm the action.



TIP To record a single shot as opposed to the entire timeline, select the shot you want to play out and hold down **SHIFT** while clicking Insert.

The playout operation begins.

Recording in Assemble Mode

recording:Assemble modeplaying out:in Assemble modeUse Assemble mode when recording on a tape that contains a valid control track up until a certain point, but you need to record beyond that point. In Assemble mode, you are attaching video and audio to existing material. For example, yesterday you played out your work onto a blank tape using Record mode. Today, you have completed additional work and would like to add it to the end of the tape. In this case, you cue the tape to the in point (at a point where there is a valid control track) and begin playing out in Assemble mode. The timecode is continued from the previously recorded material.

NOTE When recording to tape, you can only configure specific video and audio tracks to play out if you are in Insert mode.

To record in Assemble mode:

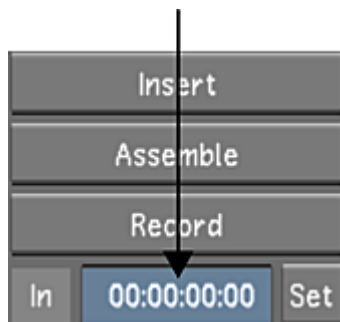
- 1 Set the VTR to Regen timecode.
- 2 Before you can play out to a VTR, you must render the timeline at the appropriate video resolution. See [Rendering Shots](#) (page 591) and [Playout Workflow](#) (page 662).
- 3 Click Editing, and then click Playout to display the Playout menu.
- 4 Select a raster for playout. See [Selecting a Raster for Playout](#) (page 662).
- 5 In the Sync Mode list, select the synchronization mode. See [Playout Menu Options](#) (page 658).
- 6 (Optional) To record only a portion of the timeline, use markers to define where, in the timeline, you wish to start and stop recording to tape. See [Defining In and Out Markers when Playing Out to Tape](#) (page 664).

- 7 In the Source Payout From group, determine where the playout operation starts.

Click:	To start the playout:
Begin	From the start of the current timeline.
Actual	At the current frame.
Markers	At the in marker in the timeline, and stop at the out marker.



- 8 In the In field, enter the tape timecode where the video is to be edited.



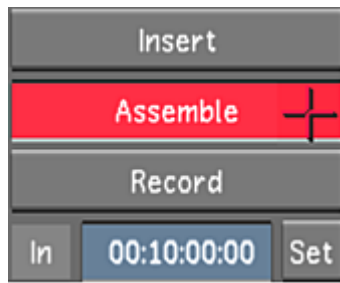
TIP To find the desired timecode more quickly, click the Source Timecode field next to the playback controls while still in the Playout menu. The playback controls and Source Timecode field turns blue to indicate that they can be used to control the VTR. Scrub to the desired timecode, then enter it in the Tape Rec IN field.

- 9 (Optional) In the Record To Tape Mode group, enable Preview.



With Preview enabled, your footage is played out in the Player, but nothing is written to tape. The Insert button turns green after the first click to show that the action is non-destructive.

- 10 (Optional) Enable Telecine. See [Writing Telecine-Style Tape](#) (page 672).
- 11 (Optional) Configure video and audio record delay. See [Playout Menu Options](#) (page 658).
- 12 Click Assemble, then confirm the action.



TIP To record a single shot as opposed to the entire timeline, select the shot you want to play out and hold down **SHIFT** while clicking **Assemble**.

The playout operation begins.

Recording in Record Mode

recording:Record modeplaying out:in Record modeUse Record mode to record an entire cut to a VTR. Record mode overwrites the entire contents of the tape (including timecode). To use Record mode, you must set the VTR timecode to Preset or Auto timecode.

You do not have to pre-stripe the tape with timecode when using Record mode.

You have the option of specifying a start timecode value, and including leader black and colour bars. Leader black and colour bars are added to the start of the program (on tape).

NOTE In Record mode, it is not possible to record a subset of the total available tracks to tape; all tracks are recorded to tape in this mode.

At least 10 seconds of black are always recorded to the video tape before the footage. Also, footage always starts on the minute. Lustre pads the leader with additional black and colour bars to ensure that the video always begins on the minute. The following examples illustrate how this is calculated.

Example 1

- Start Timecode: 00:59:00:00
- Min Colourbar Length: 15 seconds
- Black Length: 15 seconds

To begin, Lustre always records 10 seconds of black from 00:59:00:00 to 00:59:10:00 (this length is locked and is always recorded).

After the initial black, colour bars are recorded from 00:59:10:00 to 00:59:45:00 (the Minimum Colourbar Length of 15 seconds is surpassed).

Finally, black is recorded from 00:59:45:00 to 01:00:00:00 (the Black Length value of 15 seconds must be respected) and the video material begins exactly at 01:00:00:00.

Example 2

- Start Timecode: 00:59:30:00
- Min Colourbar Length: 20 seconds
- Black Length: 10 seconds

To begin, Lustre always records 10 seconds of black from 00:59:30:00 to 00:59:40:00 (this length is locked and is always recorded).

After the initial black, colour bars are recorded from 00:59:40:00 to 01:00:50:00 (the Minimum Colourbar Length of 20 seconds is surpassed).

Finally, black is recorded from 01:00:50:00 to 01:01:00:00 (the Black Length value of 10 seconds must be respected) and the video material begins exactly at 01:01:00:00.

In this case, the Minimum Colourbar Length and the Black Length (which combine to add up to 30 seconds) does not fit into the gap between 00:59:40:00 and 01:00:00:00 (20 seconds). Because video must always start on the minute, additional colour bars are added so that the material starts at the next minute.

To record to a VTR in Record mode:

- 1 Before you can play out to a VTR, you must render the timeline at the appropriate video resolution. See [Rendering Shots](#) (page 591) and [Playout Workflow](#) (page 662).
- 2 Click Editing, and then click Playout to display the Playout menu.
- 3 Select a raster for playout. See [Selecting a Raster for Playout](#) (page 662).
- 4 In the Sync Mode list, select the synchronization mode. See [Playout Menu Options](#) (page 658).
- 5 (Optional) To record only a portion of the timeline, use markers to define where, in the timeline, you wish to start and stop recording to tape. See [Defining In and Out Markers when Playing Out to Tape](#) (page 664).
- 6 In the Source Playout From group, determine where the playout operation starts.

Click:	To start the playout:
Begin	From the start of the current timeline.
Actual	At the current frame.
Markers	At the in marker in the timeline, and stop at the out marker.



- 7 (Optional) In the Record To Tape Mode group, enable Preview.



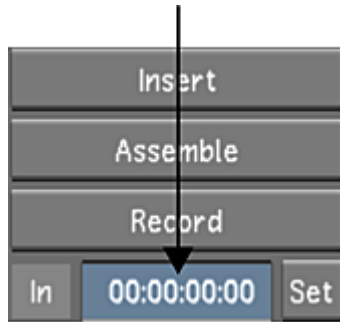
With Preview enabled, your footage is played out in the Player, but nothing is written to tape.

- 8 In the Record Mode Options group, determine where on the video tape you want to record to:
 - Enable Tape Begin to rewind to the start of the tape, and then begin the playout.

- Enable Actual to start the playout operation at the current frame of the tape.



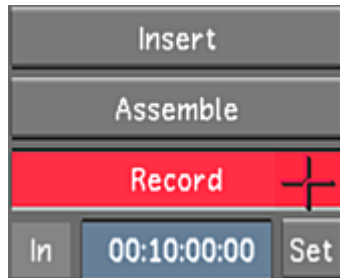
- 9 Enter the start timecode in the In field.



- 10 Enter the minimum colour bar length and the minimum Black length in the Bars Length and Black Length fields, respectively.



- 11 (Optional) Configure the video and audio record delay. See [Playout Menu Options](#) (page 658).
- 12 Click Record, and then click it again to confirm the action.



The playout operation begins.

VTR Emulation

VTR:emulation When configured to emulate a VTR, Lustre can be controlled, using an RS-422 interface, by a third-party application or device. You control Lustre VTR emulation from the application or device that treats Lustre as a VTR device. Lustre supports SD and HD emulators.

The RS-422 commands that you can use for VTR emulation are summarized as follows:

- Play
- Reset TC IN
- TC IN+

■ Stop	■ Reset TC OUT	■ TC IN-
■ REW	■ Mark TC IN	■ TC OUT+
■ FF	■ Mark TC OUT	■ TC OUT-
■ PREROLL	■ Set TC IN	■ CUE to (given) TC
■ PREROLL TIME PRESET	■ Set TC OUT	■ CUE to TC OUT
■ SHUTTLE	■ AUTO mode ON	■ EDIT channels preset
■ JOG	■ AUTO mode OFF	■ Eject
■ VARPLAY		

NOTE Unless otherwise configured by the controller device, the pre-roll time on the Lustre VTR emulator defaults to seven seconds with each video initialization.

To operate Lustre as a VTR:

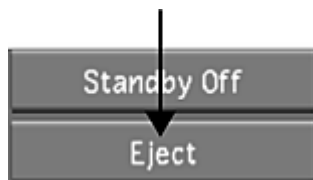
- 1 Connect Lustre to the breakout box by doing one of the following:
 - If Lustre is running on the IBM® IntelliStation® Z Pro 6223 or the HP® xw8400, connect to the B port on the DVS Centaurus breakout box.
 - If Lustre is running on the HP xw8600, connect to the B port on the AJA breakout box.
- 2 Connect the master application or device to Lustre on the patch panel using a straight pin-to-pin serial cable. A cross-cable will not work.

WARNING Save your grade before editing your project, or you will lose any unsaved work.

- 3 Launch Lustre and navigate to the Engineering page of the Project Management settings (See [Engineering Settings](#) (page 73)).
- 4 Enable VTR Emulator.
- 5 Use the Offset in Frames slider to set the number of frames you wish to shift ahead as footage is transferred from the controlling device to Lustre. Enter a negative number of frames to shift the clip backwards.
- 6 Click Save Project.
- 7 Click Editing, and then click Payout to display the Payout menu.
- 8 Select a raster for payout. See [Selecting a Raster for Payout](#) (page 662).
- 9 Prior to payout from the VTR emulator, perform the following tasks:
 - Add a header of at least five seconds to the start of the Storyboard.
 - Verify that the start Timecode begins at the end of the header, and not at 00:00:00:00. This is necessary because the Lustre VTR emulation does not provide a pre-roll outside of the boundaries of the existing Storyboard.

To disable VTR emulation:

- 1 Click Eject.



- 2 To re-initialize, either switch between the Editing Capture and Playout menus, or re-select the DVS raster.

Writing Telecine-Style Tape

The Telecine feature allows you to emulate grading with telecine tape. The original source timecodes are written to tape, and each shot is separated by a black sequence of duration equal to Black Length value field.

Before you can use the Telecine feature, you must configure the VTR and the breakout box.

To configure the VTR:

- 1 Set the VTR's timecode configuration to:
 - Record run.
 - Preset Timecode Generation.

NOTE The timecode data is transferred through the RS-422 connection.

To output telecine-style tape:

- 1 Enable Telecine prior to starting the playout operation.



- 2 Sort the timeline in C mode (with or without Head/Tail) using the C-Mode option found in the Editing > Assemble > Sort Modes menu.
- 3 (Optional) To resize *rendered* 2K or HD content to NTSC or PAL resolutions:
 - Select an NTSC or PAL raster.
 - Enable the Pulldown option.
- 4 Click Assemble once, and then a second time to confirm the action.

Playout and GPU Acceleration

It is possible to play out real-time content to tape without having to first process by using the power of the graphical processing unit, or GPU.

- Use Real-time deliverables. See [Creating Real-Time Deliverables from the Timeline or Rendered Material](#) (page 673).
- Playout from the timeline. See [Playout from Timeline with GPU Acceleration](#) (page 677).

Creating Real-Time Deliverables from the Timeline or Rendered Material

10-bit:recording without renderingreal-time deliverables:overviewYou can record 10-bit, multi-format video deliverables to tape from existing source or rendered footage without having to perform additional render passes. These deliverables are processed in real time and are subject to high-quality resizing.

NOTE Support for real-time deliverables depends on the version of the graphics card installed on your system.

Real-time deliverables can include specific primary grading (excluding curves), most reposition types, and hardware LUTs. Animation on primary grading, and on panning and scanning is also available and is performed in real time during output to tape. Modifications for real-time deliverables are displayed in Deliverable (D) view and do not affect the master version's Output view or rendered version's Print view. When playing out, you can use either source or rendered material.

NOTE Real-time deliverables playout cannot include output primary grading, secondary grading, or rotations. These types of modifications must be rendered or copied to the real-time deliverables module prior to playout. See [Sharing Modifications Between Setups and Grades](#) (page 676).

For example, you could use 2K rendered footage to create an HD tape and a DVD version without having to render again. Alternately, you could use source material and apply primary grading and repositioning that only affects the real-time deliverable, and does not require a render pass prior to playing out.

Creating Setups for Real-Time Deliverables

presets:for real-time deliverablesreal-time deliverables:creating presetsAfter you switch to Real-Time Deliverables mode, the work you perform on your shot is no longer saved to the grade. Instead, it is saved to a real-time deliverables setup file. This file contains grading and reposition information that is separate from the grade file. The setup file is an XML-based grade file, which allows you to use it with other systems.

NOTE You can share grading between real-time deliverables setups and grade files. See [Sharing Modifications Between Setups and Grades](#) (page 676).

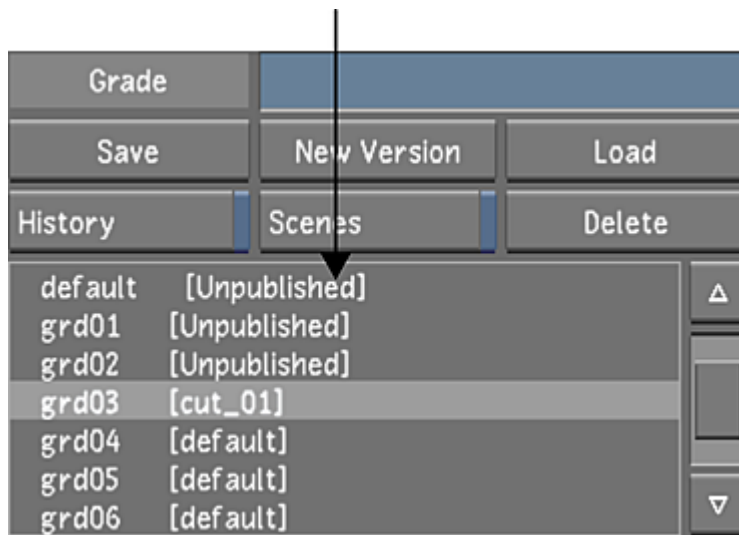
Although real-time deliverables setups are linked to the grade file, you can apply a setup to a grade linked with a different cut.

After the setup has been created and loaded to a grade, you can switch back to the Playout menu and play out to tape in either Insert or Assemble mode.

TIP Enabling the D button also allows you to send a 10-bit buffer to the SDI output.

To create a real-time deliverables setup:

- 1 In the Main menu, click Setup, and then click Grade.
The Grade menu appears.
- 2 From the Grade list, load the grade from which you want to create a real-time deliverables setup.



- 3 Click D.

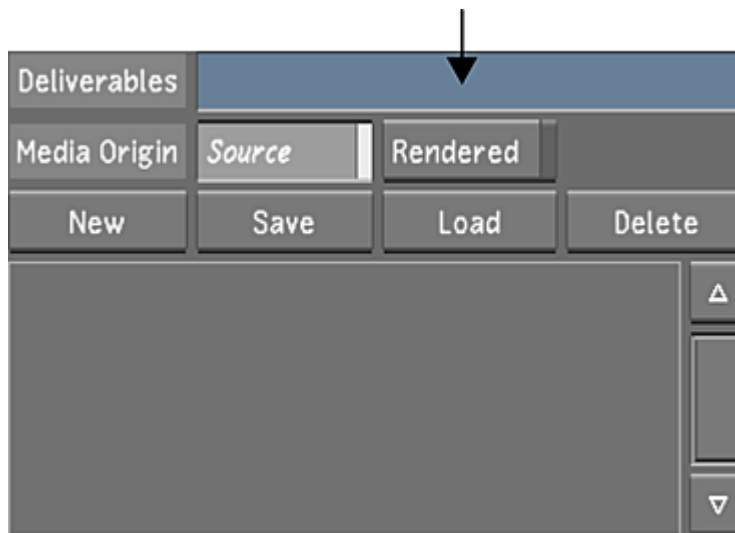


The button automatically switches you to Real-Time Deliverables view mode, and enables GPU processing. See [GPU Acceleration](#) (page 400).

NOTE If the screen shows a red X instead of an image, the enabled Media Origin contains no media. The following step tells you what to do.

- 4 Select the media origin to be used during playout. Enable Source for original, unrendered material. Enable Rendered for rendered material.

NOTE Unrendered changes made to source material will not be applied to setups. Also, when you select Source (O scans) as the media origin, Grade file settings are bypassed.
- 5 In the Deliverables field, enter a name for the setup.



- 6 Click New. The setup name is added to the list of setups for the grade.
- 7 (Optional) Perform reposition modifications such as panning and scanning, resizing, and repositioning. See [Repositioning Images](#) (page 369).

NOTE Rotations cannot be included in real-time deliverables setups.

- 8 (Optional) Perform input primary colour grading. See [Primary Colour Grading](#) (page 415).

NOTE Only input primary grading is permitted for real-time deliverables setups.

- 9 (Optional) Apply a HW LUT, using a grade file to store it. Real-time deliverables do not save Print Lut reference. See [Applying LUTs for Viewing \(Print LUTs\)](#) (page 188).

NOTE When creating real-time deliverables setups, you can only apply a HW LUT to the main monitor. In other words, you can only enable the button labelled 1.

- 10 Return to the Setup Grade menu.

- 11 Click Save to save the setup.

The setup is saved to the scene's Library folder as an XML file. The file uses the real-time deliverables setup name, preceded by the name of the grade on which it is based. For example, if the grade name is *grd01*, and the setup name is *My_HD*, the XML grade file is *[grd01]My_HD.deliv.xml*.

TIP You can save different versions of the same setup according to your mastering requirements.

Once a setup exists, it can either be loaded to the grade for which it was created, or loaded to a different grade.

To load a setup to the grade for which it was created:

- 1 In the Deliverables section of the Grade menu, select a setup from the list and click Load. This loads both the grade and the setup.

To load a setup to a different grade:

- 1 In the Grade menu, load the grade on which you want to apply the existing deliverables.
- 2 Select a setup from the list, and press **Ctrl** while clicking Load. This loads the setup to the grade.

To rename a setup:

- 1 Middle-click the setup name.
- 2 Enter the new name, and then press **Enter**.

To delete a setup:

- 1 Select a setup from the list, and click **Delete**.

Resizing Shots Prior to Playing Out

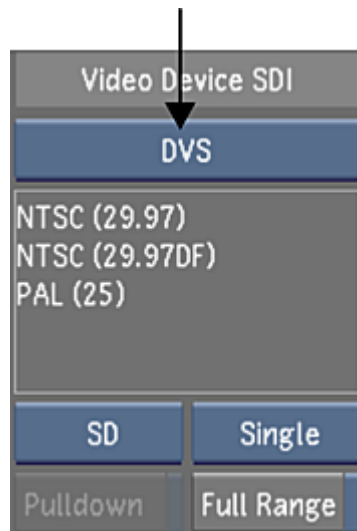
real-time deliverables:resizingresizing, real-time deliverablesBefore you play out real-time deliverables, resize your shots to ensure that they properly conform to the destination output format. See [Resizing Shots](#) (page 594).

Playing Out Real-Time Deliverables to Tape

real-time deliverables:playing outplaying out:real-time deliverablesAfter a setup has been created and loaded to the desired grade, and resizing has been performed, you are ready to play out to tape.

To play out real-time deliverables to tape:

- 1 In the Main menu, click **Editing**, and then click **Playout**.
The Playout menu appears.
- 2 Toggle the Video/Graphics raster option box to display the graphics card (GFX/SDI).



- 3 Toggle the Link Type option box to the required link type (Single or Dual).
- 4 Toggle the Format option box to the required raster format (SD, HD, Film, or Audio).
- 5 In the Raster list, select a raster.
- 6 Play out to tape in either Insert or Assemble mode. See [Recording in Insert Mode](#) (page 664) and [Recording in Assemble Mode](#) (page 666).

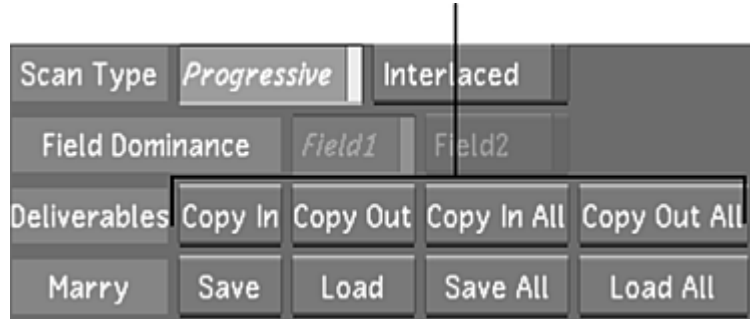
Sharing Modifications Between Setups and Grades

real-time deliverables:copying changes to or from the grade filegrades:copying unrendered changes to real-time deliverables
real-time deliverables:sharing, changes between grades and real-time deliverablesBy default, unrendered

changes to a grade file are not applied to real-time deliverables setups, and modifications made to a setup are not copied back to the grade. However, you can force changes to be copied back and forth either on a shot-by-shot basis or for the entire scene.

To share modifications between setups and grades:

- 1 In the Grade menu, click one of the Deliverables buttons.



Click:	To transfer:
Copy In	Modifications made to the current shot from the grade to the setup.
Copy In All	Modifications made to the scene from the grade to the setup.
Copy Out	Modifications made to the current shot from the setup to the grade.
Copy Out All	Modifications made to the scene from the setup to the grade.

Playout from Timeline with GPU Acceleration

NOTE When playing out from source, playback performance may be impacted depending on the grading applied to the current shot. If frames are dropped during play out, Lustre recues the VTR to the last known frame laid down to tape.

GPU preview processing:playing out from source withplaying out:from source with GPU preview processingYou can now use GPU acceleration to play out source material in real time with Print LUT, primary and secondary grading, and GPU-accelerated plugins applied. While Real-Time Deliverables mode allows you to play out directly to tape, it only permits primary grading, resizing, pan and scan, and LUT processing. The Playout From Timeline option lets you play out source material containing secondary grading without having to first perform a rendering pass.

By enabling the Playout From Timeline function in the project settings or the Playout menu, and by enabling GPU acceleration, you can play out from Output view mode and use all features currently supported by enhanced GPU acceleration.

NOTE If you enable the Playout From Timeline function in project settings, playing out from the Output view is the default for this project. If you enable the Playout From Timeline function from within the Playout menu, this setting applies only for the current session.

- For more information about GPU acceleration, see [GPU Acceleration](#) (page 400).
- For more information about Output view mode, see [Setting Image View Options](#) (page 320).

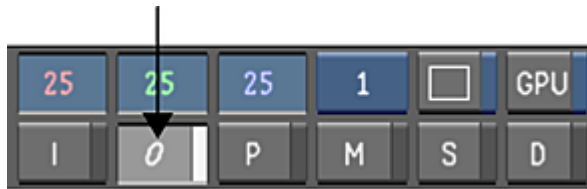
If you want to play out at a different resolution than your timeline, use the real-time deliverable solution. But if you want to play out content with complex grading, use Play out from Timeline, in which case you are limited to using the same resolution as the source.

To play out source material to tape with all features supported by GPU acceleration mode:

- 1 Enable the Playout From Timeline setting by doing one of the following:
 - In your project settings, enable Playout from Timeline in the Engineering menu. See [Engineering Settings](#) (page 73).
 - In the Playout menu, enable Playout from Timeline. See [Playout Menu Options](#) (page 658).

NOTE When you define settings in Project Management, these settings become the default settings whenever this project is loaded. When you define settings in the application (that is, not in the project settings), Lustre reverts to the project setting defaults upon reboot.

- 2 Set the Player to the O view by clicking O.



NOTE You must set the Player to the O view to be able to record unrendered media to tape and to use GPU acceleration.

- 3 Enable GPU acceleration by clicking GPU or by pressing Y on your keyboard.
- 4 Play out to the VTR. See [Playing Out to a VTR](#) (page 662).

Expected Performance

Real-time playback is not guaranteed when you play out directly to tape with GPU acceleration. The playback speed indicator in the GUI is a good indicator of what to expect when you lay down the timeline to tape. If frames are dropped when you play back your timeline on the SDI monitor, the same is likely to occur when you play out to tape.

You can expect good playback with no dropped frames when you ensure the following:

- HD or SD format is used for both capture and output (no resize applied).
- Up to four secondaries with keys are used, with a maximum of one geometry per secondary.
- A 3D Mesh LUT is enabled.
- GFX/SDI is enabled in the Playout menu.

Regardless of whether or not you conform to all conditions stated above, some animations may not play back in real time.

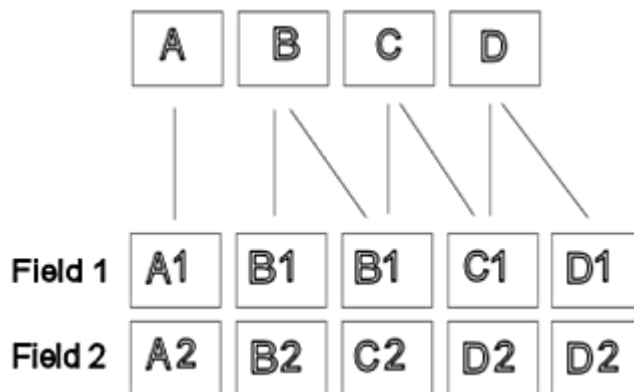
NOTE Support for direct playout to tape from GPU acceleration depends on the version of the graphics card installed on your system.

About 3:2 Pulldown

When capturing from or playing out to a VTR, you may want to convert footage using a 3:2 pulldown raster if the incoming video is NTSC or 1080i HD.

When film, which plays at 24 fps, is telecined to either NTSC or 1080i HD video, which plays at 29.97 fps, an extra 'pulldown frame' is added for every four film frames. This is because a straight 1:1 playback of film frames at NTSC or interlaced HD speeds results in a faster than appropriate playback. The telecine machine used to transfer film to video adds the pulldown frame by taking four consecutive film frames (A, B, C, and D) and performing a telecine to five interlaced video frames (A1A2, B1B2, B1C2, C1D2, and D1D2). Consequently, the pulldown insertion process creates two hybrid frames (B1C2 and C1D2), as shown in the following diagram.

NOTE The '1' and '2' suffixes after the frame letters denote the field number in each interlaced frame of NTSC or 1080i HD video. They do not represent a sequence over time.



When you capture NTSC or 1080i HD video previously telecined from film, you may want to conform with 24 fps progressive footage. In this case, you should capture the NTSC footage and simultaneously remove the 3:2 pulldown frame. When a 3:2 video SDI raster is selected, you can select the first pulldown field in the footage by clicking on the appropriate Pulldown Field button in the Capture menu. Then, the five interlaced NTSC frames are reconfigured into four progressive frames.

When you are ready to record to a VTR, you might need to record to NTSC or 1080i HD video. If your cut runs at 24 fps, you need to configure Lustre to add a 3:2 pulldown frame to bring the frame rate up to 29.97 fps. In this case, use the Pulldown Field button in the Playout menu to specify which of the five pulldown fields will be the first in the sequence to be recorded to tape. Lustre will add the additional 3:2 pulldown frame for every four frames starting at the specified field.

Converting Logarithmic to Linear

versioning, for film and videovideo:outputting multiple versionsYou can output your film scans to video once you have completed the film grading. There are two general workflows you can use to convert logarithmic images to linear ones:

- Using the Render Viewing option
- Creating manually a Log-to-Lin conversion LUT

To convert logarithmic images to linear ones using the Render Viewing option:

- 1 Use the same project and the same source footage.
- 2 Switch to Lin mode. See [Setting Logarithmic or Linear Mode](#) (page 115).
- 3 Colour grade the footage for video.
- 4 In the Render > Local menu, enable Viewing in the Rendering group, and then adjust the black, white, and gamma as needed.
- 5 Render the files in the correct video resolution. See [Rendering Shots](#) (page 591).

NOTE When Render Viewing is ON, the output render format is set automatically to 8-bit BMP files.

- 6 Play out the rendered frames to record them on an appropriate VTR.

To convert logarithmic images to linear ones by manually creating a Log-to-Lin conversion LUT:

- 1 Use the same project and the same source footage.
- 2 Switch to Lin mode. See [Setting Logarithmic or Linear Mode](#) (page 115).
When you switch to Lin mode, a Log-to-Lin conversion LUT is applied to the images automatically.
- 3 If needed, access the Input LUT menu and adjust the parameters of the default Log-to-Lin conversion.
- 4 Switch off monitor calibration (since the final render will also be seen on a monitor) and turn off any Print LUTs.
- 5 Use the Render Output menu to adjust the white, black, and gamma as needed.
- 6 Colour grade the footage for video.
- 7 Render the files in the correct video resolution. See [Rendering Shots](#) (page 591).
- 8 Play out the rendered frames to record them on an appropriate VTR.

Broadcast Monitor Supported Timings on Lustre Workstations

The following broadcast monitor timings are supported on Lustre Linux workstations.

AJA Kona 4

Format	Resolution	Supported Frame Rates	Signal	4:2:2	4:4:4	Stereo 4:2:2	HDMI Out
SD	720 x 486	29i	1.5 G	1 x SDI	2 x SDI		Yes
SD	720 x 576	25i	1.5 G	1 x SDI	2 x SDI		Yes
HD	1280 x 720p	50p, 59p, 60p	1.5 G	1 x SDI	2 x SDI		Yes
HD	1920 x 1080	23p, 24p, 25p, 29p, 30p, 50i, 59i	1.5 G	1 x SDI	2 x SDI or 1 x 3G SDI	2 x SDI	Yes
HD	1920 x 1080	23psf, 24psf, 25psf	1.5 G	1 x SDI	2 x SDI	2 x SDI or 1 x 3 G SDI	No
HD HFR	1920 x 1080	50p, 59p, 60p	3 G	1 x SDI			Yes
2K DCI	2048 x 1080	23p, 23psf, 24p, 24psf, 25p, 25psf, 29p, 30p	1.5 G	1 x SDI	2 x SDI or 1 x 3G SDI	2 x SDI	Yes

Format	Resolution	Supported Frame Rates	Signal	4:2:2	4:4:4	Stereo 4:2:2	HDMI Out
2K DCI HFR	2048 x 1080	50p, 59p, 60p	3 G	1 x SDI			Yes
UHD	3840 x 2160	23p, 24p, 25p, 29p, 30p	1.5 G	4 x SDI	4 x 3G SDI		Yes
UHD HFR	3840 x 2160	50p, 59p, 60p	3 G	4 x SDI			Yes
4K	4096 x 2160	23p, 24p, 25p, 29p, 30p	1.5 G	4 x SDI	4 x 3G SDI		Yes
4K HFR	4096 x 2160	50p, 59p, 60p	3 G	4 x SDI			Yes

AJA Kona 3G Quad

Format	Resolution	Supported Frame Rates	Signal	4:2:2	4:4:4	Stereo 4:2:2	HDMI Out
SD	720 x 486	29i	1.5 G	1 x SDI	2 x SDI		Yes
SD	720 x 576	25i	1.5 G	1 x SDI	2 x SDI		Yes
HD	1280 x 720p	50p, 59p, 60p	1.5 G	1 x SDI	2 x SDI		Yes
HD	1920 x 1080	23p, 24p, 25p, 29p, 30p, 50i, 59i	1.5 G	1 x SDI	2 x SDI or 1 x 3G SDI	2 x SDI	Yes
HD	1920 x 1080	23psf, 24psf, 25psf	1.5 G	1 x SDI	2 x SDI or 1 x 3G SDI	2 x SDI	No
HD HFR	1920 x 1080	50p, 59p, 60p	3 G	1 x SDI			Yes
2K DCI	2048 x 1080	23p, 23psf, 24p, 24psf, 25p, 25psf, 29p, 30p	1.5 G	1 x SDI	2 x SDI or 1 x 3G SDI	2 x SDI	Yes
2K DCI HFR	2048 x 1080	50p, 59p, 60p	3 G	1 x SDI			Yes

Format	Resolution	Supported Frame Rates	Signal	4:2:2	4:4:4	Stereo 4:2:2	HDMI Out
UHD	3840 x 2160	23p, 24p, 25p, 29p, 30p	1.5 G	4 x SDI	4 x 3G SDI		Yes
4K	4096 x 2160	23p, 24p, 25p, 29p, 30p	1.5 G	4 x SDI	4 x 3G SDI		Yes

There are a few ways you can hear audio during a timeline playback:

- You can import audio files to the system.
- You can capture audio from a video tape recorder (VTR) or audio tape recorder (ATR).
- You can have an external device chase the audio timecode by using the longitudinal timecode (LTC) chase option.

The audio signal is captured and played back from the DVS or AJA breakout box (BOB). For information on connecting the external audio devices, refer to your hardware guide. When you are capturing, playing back, or playing out audio tracks, you can select up to 16 tracks (eight tracks of DVS/AJA AES audio, or 16 tracks of embedded AJA audio) from the track selector at a sampling rate of 48 kHz (16-bit or 24-bit). See [Capture Menu Options](#) (page 639) or [Playout Menu Options](#) (page 658).

NOTE To monitor the audio from the DVS/AJA BOB, the AES audio needs to be converted to an analog audio signal. To do this, use a digital audio mixer or a digital to analog converter (e.g., the Lucid converter). Refer to your hardware guide for information about the Lucid converter.

Audio Workflow

audio:workflowworkflows:audioUse the following typical workflow to add audio to your video playback.

Step:	Refer to:
1. Import or capture the audio file.	Importing an Audio File (page 684), Importing Audio From Wiretap (page 685), or Capturing an Audio File (page 686).
2. Playback the selected audio file/tracks with the video.	Playing Back Audio with the Timeline (page 687) or Playback Using the LTC Chase Option (page 690).
3. Playing out the audio file/tracks with the video.	Playout of Audio and Video (page 692).

Importing an Audio File

audio:importing file;importing:audio files;copying:audio files into LustreLustre can use the audio files that you import into the scene's *Library\audio* directory or embedded in media imported from the Wiretap or Wiretap Gateway server.

NOTE The audio folder is automatically created when you create a scene.

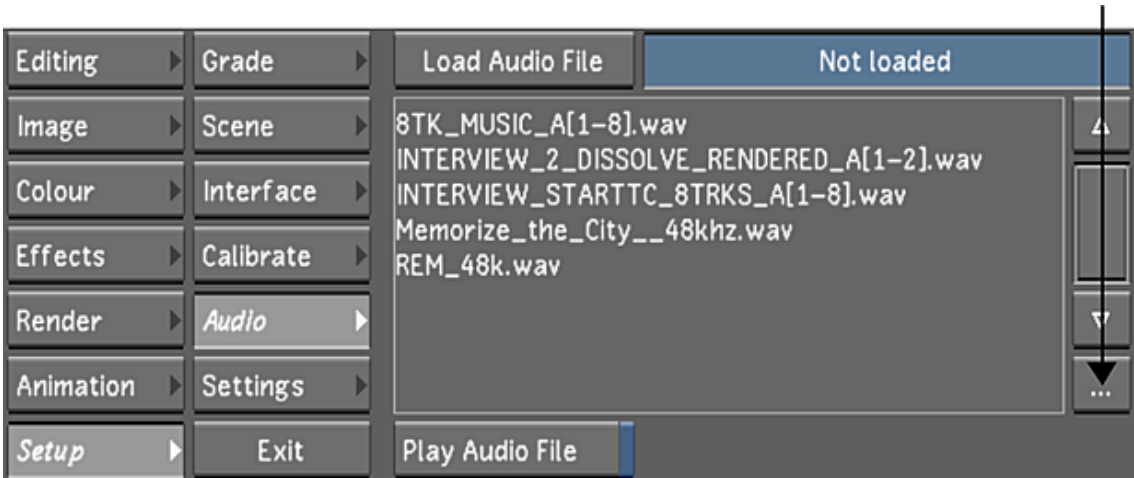
An imported audio file can comprise of a single track or up to 16 interleaved tracks.

There are three ways to import audio into Lustre:

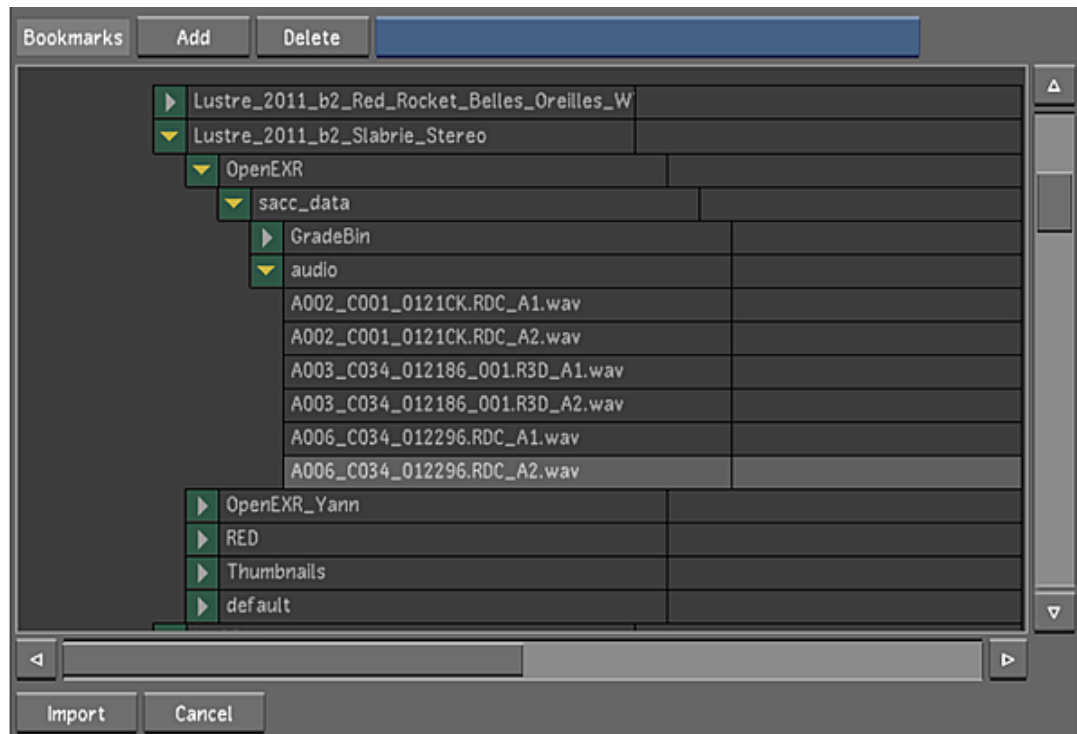
- Outside of Lustre, copy WAV or AIFF files manually to the scene's *Audio* folder.
- Within Lustre, import copies of audio files using the Import file browser.
- Within Lustre, import audio through the Wiretap server and Wiretap Gateway server.

To import an audio WAV or AIFF file while in Lustre:

- 1 Click Setup in the Main menu, and then click Audio.
- 2 In the audio file list, click the Browse button.



The Import file browser appears.



- 3 Navigate to the appropriate source folder and select one or more audio files (You can also use [bookmarks](#) (page 210) to retain a list of folder locations). Traditional methods of multi-selecting (Shift-click, Ctrl-click) are enabled.
- 4 Click Import.
A copy of the audio file is imported into the *Audio* folder, and appears in the audio file list.

NOTE If you add audio files to the scene's *Audio* folder after launching Lustre, press **Ctrl+R** to refresh the audio file list.

Importing Audio From Wiretap

audio:importing from WiretapWiretap:importing audioYou have the option of including audio tracks when you import content containing audio from the Wiretap server. Since the content contains raw audio, you can import the audio tracks as a WAV (including multi-channel WAVE Extensible files) or AIFF file (the bit depth of the file is preserved and the Single File Capture option is not applicable). To set audio file type, see [Capture Menu Options](#) (page 639).

You can also import audio embedded in compressed media files from the Wiretap Gateway server as a WAV or AIFF file. When importing multiple files, only the audio track(s) for one of these files can be used within Lustre since Lustre is limited to a single audio file (or group of files) per grade.

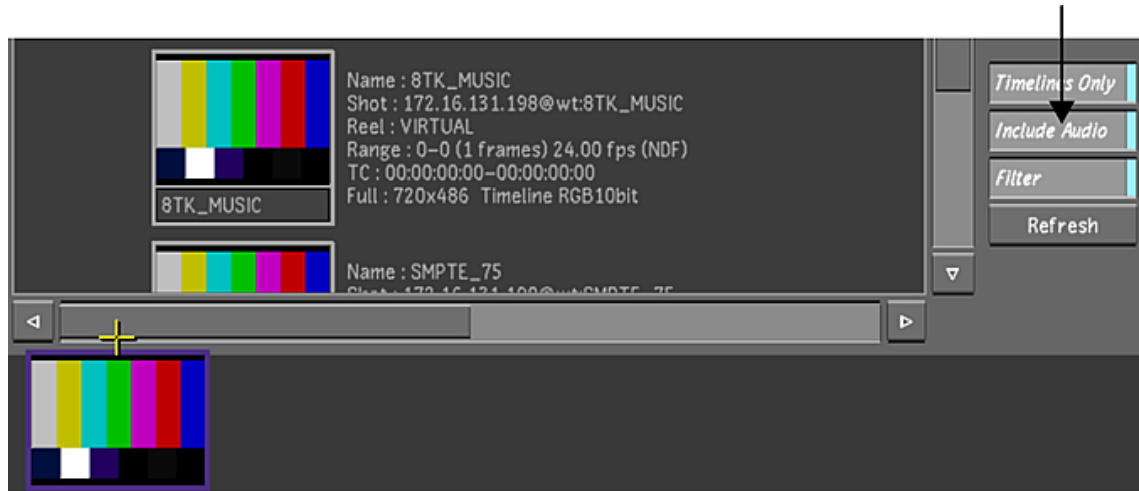
NOTE You cannot import audio only clips.

To import audio files using Wiretap:

TIP All audio Timeline FX and dissolves must be rendered on a Visual Effects and Finishing application prior to being imported into Lustre.

- 1 Click **Editing** in the Main menu, and then click **Browse**.

- 2 Complete one of the following:
 - In the file browser, use the Wiretap server to navigate to a library containing a timeline with audio tracks.
 - In the file browser, use the Wiretap Gateway server to navigate to a media file that contains embedded audio tracks.
- 3 Make sure Include Audio is enabled, then select the file and drag it to the Storyboard.



- 4 Click Setup in the Main menu, and then click Audio.
 The audio file from the Wiretap media has been imported and is automatically loaded and ready to play. If multiple tracks were imported, the tracks are grouped together under the same file name. For example, if the name of the media is **8TK_MUSIC**, Lustre displays the file as **8TK_MUSIC_A[1-8].wav** (where [1-8] represents the number of tracks within the file).

8TK_MUSIC_A[1-8].wav

NOTE You can only import audio tracks from the Wiretap server and Wiretap Gateway server. The audio tracks cannot be rendered back.

Capturing an Audio File

audio:capturing a filecapturing:audio fileYou can capture an audio signal of up to 16 tracks as a single 48 kHz (16-bit or 24-bit), interleaved WAV or AIFF file. The audio is saved in the scene's *Audio* folder. If using the Linux version of Lustre, the filename uses forward slashes.

NOTE The audio folder is automatically created when you create a scene.

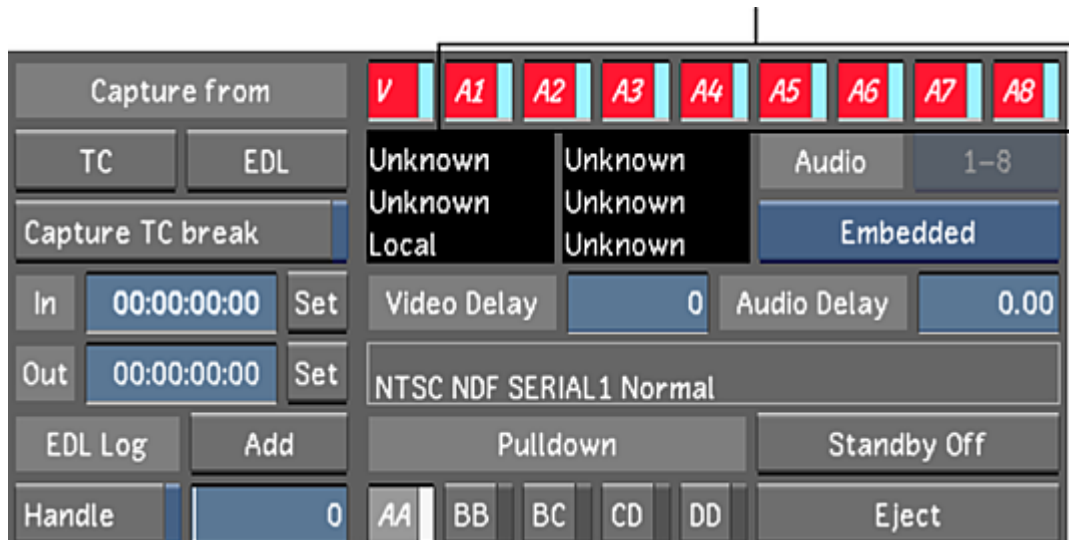
To capture an audio WAV or AIFF file:

- 1 Click Editing in the main menu, and then click Capture.
- 2 Select the appropriate raster. See [Selecting a Raster for Capture](#) (page 646).
- 3 Select the audio file type, bit depth, and determine if you want to capture the audio tracks as a single or multiple files. Single File Capture is enabled by default.



- 4 Enable the audio track(s) you want to capture.

NOTE You have the option of capturing the video along with the audio. See [Capturing from Timecode](#) (page 648).



- 5 Click the TC button to start the capture.

If the audio you are capturing is on numerous tracks and the Single File Capture option is enabled, Lustre groups all the tracks with the same name and displays them as a single file (e.g., **file_name.wav**). If Single File Capture is disabled, each track is saved separately but grouped together in the audio file list. For example, the audio file name will be **file_name_A[#-#].wav**, where the numbers within the brackets represent the number of tracks within the file.

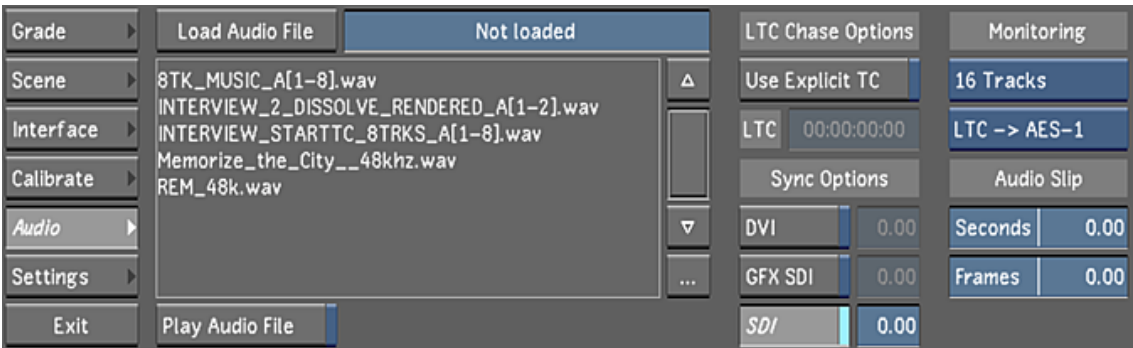
NOTE When you capture a broken selection (e.g., tracks A1, A3, and A5) and Single File Capture is enabled, the resulting single audio file contains three tracks. Therefore, in the Playout menu, tracks A1, A2, and A3 are enabled. If Single File Capture is disabled, the three tracks are saved as three separate files and in the Playout menu, tracks A1, A3, and A5 are enabled.

Playing Back Audio with the Timeline

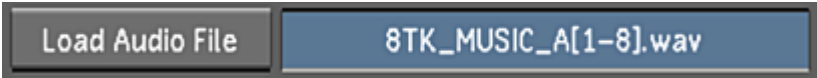
audio:playing backOnce the audio file is in the audio folder, you can play it back at the same time as your timeline.

To play back an imported audio file with the timeline:

- 1 Click Setup in the Main menu, and then click Audio.
The Audio menu is displayed.



- 2 (Optional) Import an audio file into the audio file list. See [Importing an Audio File](#) (page 684).
- 3 Select a file from the audio file list.
NOTE Only one audio file can be associated with the timeline.
- 4 Click Load Audio File.
The selected audio file is displayed in the audio file field and the Play Audio File button is automatically enabled.



- NOTE** When you capture an audio file, it is automatically loaded.
- 5 Select a Monitoring option. See [Audio Monitoring Options](#) (page 688).
 - 6 (Optional) Set an audio offset if the audio is to begin at a certain time before, or after, the video has begun. See [Offsetting the Audio File](#) (page 689).
 - 7 (Optional) Select a Sync option. See [Sync Options](#) (page 690).
- Now when you play the timeline, the audio file is played as well.
- TIP** Disable the Play Audio File button if you do not want to hear the audio during playback.

While the audio file is playing back, you can scrub the audio.

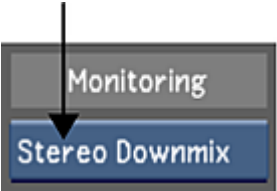
Press:	To:
Alt+click location in the shot/scene timebar	Scrub the audio to the location you selected.
Ctrl+Alt+drag in the shot/scene timebar	Scrub the audio forward or backward quickly.

Audio Monitoring Options

audio:monitoring optionsmonitoring optionsWhen you are playing back audio with your video, you need to make sure your playback settings correspond to your audio configuration. Typically, each track is played through a corresponding port (e.g., track 1 passes through port 1, track 2 passes through port 2, etc.), but your system might be configured to have multiple tracks going through a single port (e.g., tracks 1, 3, and 5 pass through port 1). The Monitoring option allows you to set how the tracks are played back.

NOTE If you disable any audio tracks in the Layout menu, it will not be heard during playback.

To select a monitoring option, click the Monitoring option box to select the monitoring option you want.



Select:	Audio Device:	When:
Stereo Downmix	DVS or AJA	There are only two audio tracks that are supported on the audio monitoring device. All the odd numbered tracks (e.g., 1, 3, 5, etc.) go through port 1 and all the even numbered tracks go through port 2.
4-Track Downmix	DVS or AJA	There are only four audio tracks that are supported on the audio monitoring device.
8 Tracks	DVS only	There are up to eight tracks and each track is supported on the audio monitoring device.
8-Track Downmix	AJA only	There are only eight tracks that are supported on the audio monitoring device.
16 Tracks	AJA only	There are up to 16 tracks and each track is supported on the audio monitoring device.

NOTE The audio monitoring option can also be set within the Engineering settings tab of the project configuration settings. See [Engineering Settings](#) (page 73).

Offsetting the Audio File

audio:offsetting the fileWhen you playback the audio with the timeline, both the audio and video begin at the same time. If you want your audio to play before, or after, the video has begun, you need to enter an offset for the audio file. Use the Audio Slip option to offset the audio file. For example, if the audio file starts two seconds after the start of the timeline, create a two second offset.

To offset the audio:

- 1 Do one of the following:
 - Click and drag the Audio Slip sliders to offset the audio. If the audio starts before the video, drag right to set a positive offset. If the audio starts after the video, drag left to set a negative offset. You can use one or both sliders to set the duration of the offset.
 - Right-click within the slider to display the calculator and enter the frames and/or seconds offset to align your audio and video.

Audio Slip	
Seconds	2.00
Frames	6.66

Sync Options

audio:sync optionssync optionsDepending upon the output device you are using to view the timeline, the audio and video might not be in sync. Use the Sync Options feature to sync the audio and video. When you enable a sync option, a pre-calculated default is already applied. You only need to enter a value if the audio and video are still not in sync.

Sync Options	
DVI	0.00
GFX SDI	1.23
SDI	0.00

DVI Syncs the audio to the video that is displayed on the monitor (DVI).

GFX SDI Syncs the audio to the video that is displayed on an external device (e.g., projector, broadcast monitor, etc.).

SDI Syncs the audio to the video that is displayed on an external device connected to the DVS/AJA BOB.

To sync the audio and video:

- 1 In the Audio menu enable the Sync Options button corresponding to your output viewing device.
NOTE Your system can be connected to multiple viewing outputs, but the sync is only applied to the option that is enabled.
- 2 (Optional) Click within the field and drag the mouse left or right to set the frame value for the sync. Enter a negative number if the audio plays after the video has begun and enter a positive number if the audio plays before the video has begun.

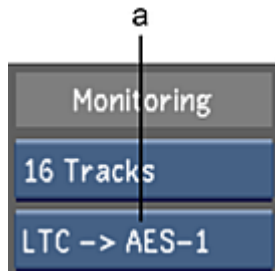
Playback Using the LTC Chase Option

audio:LTC chase optionThe LTC Chase Options allow you to send the timeline's timecode through the DVS or AJA BOB to an audio device that can chase the LTC timecode. By default, the LTC timecode is the same as the record time (REC TC). For example, if the start timecode for the timeline is 10:00:00:00, the LTC will be 10:00:00:00. When you move the shot positioner to a further position in the timeline and press play, the LTC value is also updated so it is in sync with the record timecode. If the Telecine option is enabled in the Editing>Playout menu, the LTC timecode is the same as the source timecode.

NOTE Your LTC Chase Option settings are saved in the *context.config* file.

To play back the audio track using the LTC Chase Options:

- 1 Click Editing in the Main menu, and then click Capture.
- 2 Select the appropriate raster to observe the audio and video files together. See [Selecting a Raster for Playout](#) (page 662). Refer to “Selecting a Raster for Playout” in the “Video Capture and Video Playout” chapter of the Luster user guide.
- 3 (Optional) Click Setup in the Main menu, and then Audio to display the Audio menu. If you are using the AJA BOB, select an audio channel from the LTC Track Selector that is to represent the LTC channel.



(a) LTC Track Selector option box

NOTE Since the AJA BOB does not have a designated LTC channel, you must assign one of the audio channels to be the LTC channel. Refer to the Hardware Guide for information on how to setup the AJA BOB for the LTC Chase Option.

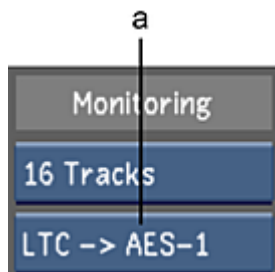
- 4 Make sure the audio device is set to chase.
Now when you play back the timeline, the audio track is played at the same time.

Use Explicit Timecode

audio:use explicit timecodeLTC chase option:use explicit timecodeIf the audio device has a different timecode than the timeline, you can set a different timecode by enabling the Use Explicit TC button. For example, if your source timecode starts at 10:00:00:00 and your audio timecode begins at 11:00:00:00, you can enable the Use Explicit TC option and create an offset of 1:00:00:00.

To play back an audio track with a different timecode:

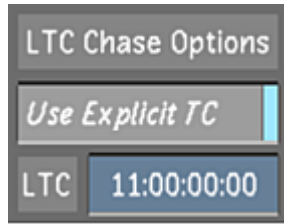
- 1 Click Editing in the Main menu, and then click Capture.
- 2 Select the appropriate raster. See [Selecting a Raster for Playout](#) (page 662). Refer to “Selecting a Raster for Playout” in the “Video Capture and Video Playout” chapter of the Lustre User Guide.
- 3 Click Setup in the Main menu, and then Audio to display the Audio menu.
- 4 (Optional) If you are using the AJA BOB, select an audio channel from the LTC Track Selector that is to represent the LTC channel.



(a) LTC Track Selector option box

NOTE Since the AJA BOB does not have a designated LTC channel, you must assign one of the audio channels to be the LTC channel. Refer to the Hardware Guide for information on how to setup the AJA BOB for the LTC Chase Option.

- 5 Enable Use Explicit TC.
- 6 In the timecode field, enter the timecode of when you want the audio track to begin.



Now when you move the shot positioner, the audio and video are in sync.

Playout of Audio and Video

playing out:audioaudio:playing out with videoOnce you have verified the playback of your audio file/track(s) and timeline, you can play out the timeline to tape. See [Playing Out to a VTR](#) (page 662).

Working with Wiretap

30

editing:overviewWiretap is Autodesk's cross-platform client-server interoperability framework, providing Lustre with high-performance access to remote media and metadata. With Wiretap, you can work with material from Autodesk Visual Effects and Finishing applications, without duplicating media. Import timelines directly from the host application, and read/write clips and frames on remote FS and Standard FS storage devices with the same ease as you would local media. In addition, Wiretap allows you work with multi-layer and stereoscopic timelines.

Lustre gains access to the remote media and metadata via Wiretap servers running on the host workstations. A Wiretap server is installed by default with most Visual Effects and Finishing applications, and runs independently of the application. By default, Lustre automatically detects all the Wiretap servers running on the Wiretap network. You can then browse for footage on the remote filesystem and load it into the Shot bin or timeline, just as if it were locally attached storage.

Working with Wiretap Timelines

Lustre can interpret a Visual Effects and Finishing timeline as a single one-sequence clip, or as an imported timeline. When you reference a Wiretap timeline in Lustre, the dissolve and splice transitions are maintained. The Wiretap timeline appears on the Lustre Storyboard as a series of shots and transitions. Each shot comprising the timeline is added separately to the Library. Working with remote timelines containing soft-imported clips is equally possible.

Lustre can import a multi-layer timeline from a Visual Effects and Finishing application and export it to the Wiretap server (only available with Wiretap 2010 Extension 1 or higher). When gaps are imported from a multi-layer timeline, they are seen as black media for Layer 1 and appear transparent for the layers above Layer 1.

Wiretap Timelines and Soft-Imported Media

Recall that in Autodesk Visual Effects and Finishing products, clips using soft-imported media contain only links to the media at its original location, so that no media is actually imported and duplicated in the Autodesk managed storage.

When importing a Wiretap timeline containing soft-imported media into Lustre, there is an additional advantage. Lustre recognizes the clips as soft-imports, and reads the associated media by way of the Wiretap Gateway server, allowing you to modify the associated input parameters. That is, you are not bound by the resolution used in the originating application, and can work in Lustre at the resolution of your choice.

For example, suppose a Smoke timeline contains soft-imported RED media at HD resolution. When importing the timeline into Lustre via Wiretap, the soft-imported media is accessed directly, via the Wiretap Gateway.

You thus have access to all the RED transcoding options for the *source* material, and can work with it at any available resolution, such as SD, HD, 2K or higher.

NOTE This discussion applies to media soft-imported to a Smoke or Flame project created in a Standard FS only. If the media has been soft-imported to Stone FS, Lustre will interpret this as media as “Stone” instead of RED.

Wiretap Timelines and Wiretap Gateway Media

Autodesk Visual Effects and Finishing applications can import a wide variety of media formats from the Wiretap Gateway. It is important to note that Lustre can read all these formats, when you import a Wiretap timeline where they are used.

In particular, when a Visual Effects and Finishing application imports RED media files via the Wiretap Gateway server, the artist sets the debayering, colour, gain and curve settings to adjust the look and size of the imported media. When Lustre imports a timeline that includes RED media, it automatically makes use of the Wiretap Gateway server to gain direct access to the original footage. You thus have access to all the RED transcoding options for the *source* material, and can work with it at any available resolution, such as SD, HD, 2K or higher.

Optimising Wiretap Playback Speed

- InfiniBand will get the fastest throughput, followed by 10 GigE and GigE in which you can get 80 MB/sec throughput. This is enough for real-time playback of SD clips, or about 1/4 real-time for 2K material.
- The Visual Effects and Finishing application on the Wiretap server host workstation can also affect performance. Applications have guaranteed access to the local framestores, but remote access by Lustre over Wiretap is at a lower priority. If you notice playback is suffering, consider generating local proxies for the remote material.
- To improve real-time playback of RED media, the Wiretap Gateway can spawn multiple slave processes that increase performance without requiring additional licenses.

Rendering to Wiretap

Once you are finished grading the material from the Stone FS or Standard FS, there are different rendering possibilities. As with any Lustre grading project, you can render to the local storage array. Under Wiretap it is also possible to render back to the Stone FS or Standard FS, and to publish soft-import links to rendered media. Wiretap:rendering

Before You Begin

This section presents important points to consider before beginning to work with Wiretap.

Timeline Considerations and Restrictions

When creating a Visual Effects and Finishing timeline for use in Lustre, please note the following.

- **Drop Frame and Non-Drop Frame:** Lustre now supports a timeline with a mix of media that has drop frame and non-drop frame. Instead of using only the timeline frame code mode, it now also uses the source clips' frame code mode.

- **BatchFX** must be rendered prior to importing your timeline in Lustre. They will be seen as regular clips in the Lustre timeline.
- **Supported Timeline Elements:** Colour sources, soft-effects, timeline gaps, dissolve transitions, and fade-ins and fade-outs are supported in Lustre.
- **Dissolves:** These are regenerated in Lustre, along with the animation curve. This is only supported by Wiretap server 2010 and higher.
- **Unsupported Transition Types:** Wipe and Axis transitions are unsupported. These are displayed as dissolves in Lustre and can be recognized by a special icon.
- **Focus Point and Saving:** In a Visual Effects and Finishing application timeline, the positioner's focus point indicates the layer of interest for edits and other operations. It also determines what appears when you import the timeline into Lustre. When saving the timeline for use in Lustre, ensure the focus point is on the top-most layer you want included in the Lustre timeline. For example, if the Visual Effects and Finishing timeline contains four layers and the focus point is on the third layer when it is saved, only three layers are included in the Lustre timeline.

Wiretap Limitations

It is important to note the following limitations:

- **Fade-Ins:** Avoid having a timeline starting with a fade-in at record timecode 00:00:00:00.
- **Tape Names:** Avoid using different shots that have the same timecode and tape name.
- **Hard-Committing:** Hard-committing a selection of shots creates a new clip with a tape name of *COMMIT*, and a source timecode obtained from the record timecode. There is no need to add this information to the shot manually. Hard-committing a single shot preserves the original tape name and timecode.
- **Start Timecode:** The Start timecode of the timeline should not be negative. Also, avoid using a timeline that begins with a fade-in and has a start timecode of 00:00:00:00.
- **Saving to a Clip Library:** Once you have added a clip to a clip library, make sure to switch to a different clip library. This both saves the clip library, and allows Wiretap to broadcast the updated information about the timeline and clips.
- **Dual Library View:** In Visual Effects and Finishing applications, the Dual Library View mode displays the contents of two clip libraries simultaneously, each in its own panel. When you switch from Dual Library View back to Single View, the newly-hidden library remains selected by the application, and is read-only to Wiretap. Lustre will be unable to render media to the clip library until it is deselected.

Wiretap Gateway Limitations

When ingesting media using the Wiretap Gateway, please note the following:

- **OpenEXR:** Lustre supports ingest of OpenEXR in 16-bit float RGB format only. Files with other channels cannot be read in Lustre.
- **RED Rocket Board:** The RED Rocket board allows real-time decoding and debayering of RED media. For Lustre, it is supported in one configuration only. This is with Lustre installed on an HP Z800 workstation running Linux, and the Wiretap Gateway installed on a Mac OS workstation containing the RED Rocket board. The board must be installed in a PCI-E x16 slot. The network connection must be 10 GigE.

Wiretap Backwards Compatibility

You can view and write back to projects created in any current Visual Effects and Finishing application. However, if a project was created using an earlier version of the software, Lustre has read-only access to it. Similar considerations apply to the Wiretap server. That is, Lustre has read/write access to media via any current Wiretap server. Earlier Wiretap servers may provide read-only access. The version of the Wiretap server is shown in the Lustre browser.

Networking

Lustre and Visual Effects and Finishing applications communicate through Wiretap over a network connection. The network infrastructure can be GigE or InfiniBand. A GigE connection is sufficient for SD and HD 8-bit workflows. An InfiniBand connection is recommended for high-resolution projects like HD 10-bit, 2K, and beyond.

See [Configuring Wiretap and Lustre](#) (page 707) and the *Autodesk Visual Effects and Finishing Installation and Configuration Guide*.

Supported Filesystems and Media Types

From the perspective of the Lustre user, there are no operational differences between accessing media on a Stone FS and a Standard FS for colour grading. However, there may be differences in performance. Performance varies when using Standard FS, depending on the configuration. Refer to “Standard FS Performance Expectations” in the *Autodesk Visual Effects and Finishing Installation and Configuration Guide*.

Wiretap Gateway Supported Media File Formats

About 32-bit float Support

- It is now possible to import 32-bit float media through Wiretap Gateway, Wiretap server, and locally. However, the media is converted to 16-bit float on import.
 - Media Import: OpenEXR (including Multi-Channel).
 - Wiretap Interchange: 32-bit media and sequences loaded from Flame through the Source Grading workflow are converted to 16-bit float on import in Lustre and returned to Flame as 16-bit float media. Sequences are flagged as 32-bit float.

NOTE The Connected Colour Workflow clamps the Lustre and Read File nodes to 16-bit float.

Image Sequence

Format	Extension	Import	Export	Depth
Alias®	.als	yes	yes	8 bits
ARRIRAW	.ari	yes	no	12 bits

Format	Extension	Import	Export	Depth
	NOTE Media is presented as a clip, never as a sequence of RAW images. Supports material shot on camera using ARRI SUP 11 or earlier, and the features from version 4.6 of the ARRIRAW SDK. This includes support for ALEXA Monochrome and ALEXA Open Gate, as well as content shot at 4x3 ratio.			
Cineon®	.cin	yes	yes	10 bits
DPX	.dpx	yes	yes	8, 10, 12, 16 bits and ADX encoding.
DPX - Single channel	.dpx	yes	no	See Note.
	NOTE Monochromatic DPX files from the following film scanners have been validated: ■ FilmLight Northlight (10 & 16-bit) ■ DigitalFilmTechnology SCANITY™ (10 & 16-bit) ■ Imagica (8, 10 & 16-bit) ■ Laser Graphics (8, 10 & 16-bit) Lustre supports single channel DPX files only when imported through Wiretap Gateway.			
Gateway	.clip	yes	no	n/a
HDR	.hdr	yes	no	32 bits
JPEG	.jpg	yes	yes	8 bits
OpenEXR	.exr	yes	yes	8, 10, 12u, 12, 16 fp bits
	Export includes OpenEXR with RLE (Run-Length Encoding) compression. Multi-Channel OpenEXR with single channel Alpha are supported. NOTE ■ Lustre does not render RGBA OpenEXR files. Do not use the Same As Scans rendering option. Use the OpenEXR RGB rendering option if you want to render 16-bit half float media files.			
OpenEXR 2.0	.exr	yes	no	8, 10, 12u, 12, 16 fp bits
	NOTE ■ Multi-part and deep pixel features are not supported: only the first part of a multi-part file can be accessed, and deep pixel channels are ignored. ■ Lustre does not render RGBA OpenEXR files. Do not use the Same As Scans rendering option. Use the OpenEXR RGB rendering option if you want to render 16-bit half float media files. ■ The resolution of the matte channels has to be identical to the beauty pass that will be used for secondary color grading.			

Format	Extension	Import	Export	Depth
Photoshop	.psd	yes	no	8 or 16 bits
	NOTE Supports RGB and RGBA.			
Pict (Macintosh®)	.pict	yes	yes	8 bits
Pixar	.picio	yes	yes	8 bits
Portable Network Graphics	.png	yes	no	8 or 16 bits
	NOTE Supports alpha.			
Precomp	.precomp	yes	no	8, 10, 12u, 12, 16 fp, or 32 fp bits
SGI®	.sgi	yes	yes	8 or 16 bits
Softimage®	.pic	yes	yes	8 bits
TARGA®	.tga	yes	yes	8 bits
Tdi/Maya®	.iff	yes	no	8 or 16 bits
Tiff	.tif	yes	yes	8 or 16 bits
Wavefront®	.rla	yes	yes	8 or 16 bits

QuickTime

Format	Extension	Import	Export	Depth
8-bit Packed YUV 4:2:2	.mov	yes	yes	
	NOTE Lossy codec. Avoid using for intermediates.			
10-bit Packed YUV 4:2:2	.mov	no	yes	
	NOTE Lossy codec. Avoid using for intermediates.			
Apple Animation	.mov	yes	no	with alpha
Apple Graphics	.mov	yes	no	
Apple® Video	.mov	yes	no	

Format	Extension	Import	Export	Depth
Cinepak	.mov	yes	no	
Component Y'Cb-Cr 8-bit 4:4:4	.mov	yes	no	8-bit planar
Component Y'Cb-CrA 8-bit 4:4:4:4	.mov	yes	no	8-bit planar
Component Y'Cb-Cr 10-bit 4:4:4	.mov	yesq	no	10-bit packed
Component Y'Cb-Cr 10-bit 4:2:2	.mov	yes	no	10-bit packed
Component Video	.mov	yes	no	8-bit packed
	NOTE 4:2:2 format			
DV 25 NTSC	.mov	yes	yes	
	NOTE NTSC & PAL Although the specifications allow the DV format to be field 1 or 2, the industry standard is "bottom first". Thus, before exporting to Flame Premium, ensure that the clip is Field 2. Reformat, if necessary.			
DVCPRO 50	.mov	yes	yes	
	NOTE NTSC & PAL			
DVCPRO HD	.mov	yes	yes	
DNxHD	.mov	yes	yes	8 bits: 36, 145, 220 (and variants) 10 bits: 220x (and variants)
	NOTE Includes support for the following varieties: 36, 60, 75, 80, 85, 90, 90x, 100, 110, 110x, 115, 145, 175, 175x, 185, 185x, 220, 220x, 444 (sometimes known as 350x).			
H.264	.mov	yes	yes	
IMX	.mov	yes	yes	
	NOTE Includes support for IMX 30, 40, and 50.			
MJPEG	.mov	yes	yes	

Format	Extension	Import	Export	Depth
	NOTE JPEG compatible			
MPEG-1	.mov	yes	no	
MPEG-4	.mov	yes	yes	
MSMpeg 4v3 (DivX)	.mov	yes	no	
PhotoJPEG	.mov	yes	no	
	NOTE RT PhotoJPEG compatible			
PNG	.mov	yes	yes	without alpha
PNGA	.mov	yes	yes	with alpha
ProRes 4444	.mov	yes	yes	12-bit
	NOTE Includes support for the XQ variant, and for ProRes files from Sony F5 and F55 cameras.			
ProRes 422 (HQ)	.mov	yes	yes	10-bit
	NOTE Includes support for ProRes files from Sony F5 and F55 cameras.			
ProRes 422	.mov	yes	yes	10-bit
	NOTE Includes support for ProRes files from Sony F5 and F55 cameras.			
ProRes 422 (LT)	.mov	yes	yes	10-bit
ProRes 422 (Proxy)	.mov	yes	yes	10-bit
Quicktime Planar RGB	.mov	yes	no	
RGB Uncompressed	.mov	yes	yes	without alpha
RGBA Uncompressed	.mov	yes	yes	with alpha

Format	Extension	Import	Export	Depth
TGA	.mov	yes	no	
	NOTE TARGA			
XDCAM	.mov	yes	no	
XDCAM HD	.mov	yes	no	
XDCAM EX	.mov	yes	no	
	NOTE There is no essence-mode browsing in a QuickTime XDCAM EX.			

MXF

Format	Extension	Import	Export	Depth
AVC-Intra 50	.mxf	yes	yes	
	NOTE Panasonic P2			
AVC-Intra 100	.mxf	yes	yes	
	NOTE Panasonic P2. Import includes support for 1080/60p. Import supports OP-Atom format.			
AVC-Intra 200	.mxf	yes	no	
AVC-Intra2K	.mxf	yes	no	
	NOTE Supports the VariCam 35 and HS, both 4:2:2 and 4:4:4 flavours.			
AVC-Intra4K	.mxf	yes	no	
	NOTE Supports the VariCam 35 and HS, both 4:2:2 and 4:4:4 flavours.			
AVC-LongG	.mxf	yes	no	
Canon XF-AVC	.mxf	yes	no	
DNxHD	.mxf	yes	yes	

Format	Extension	Import	Export	Depth
	NOTE Includes support for the following varieties: 36, 60, 75, 80, 85, 90, 90x, 100, 110, 110x, 115, 145, 175, 175x, 185, 185x, 220, 220x, 444 (sometimes known as 350x). Supports DNxHD files from ARRI ALEXA cameras, with the exception of DNxHD 444. Supports DNxHD 220x and 145 from Sony PMW-F5 and F55.			
DV 25	.mxf	yes	no	
	NOTE Panasonic P2			
DVCPRO	.mxf	yes	yes	
	NOTE Panasonic P2			
DVCPRO 50	.mxf	yes	yes	
	NOTE Panasonic P2 (PAL & NTSC)			
DVCPRO HD	.mxf	yes	yes	
	NOTE Panasonic P2. Available in 1080p@25/50, 1080p@24/30/60, 720p@25/50, and 720p@24/30/60.			
SonyRAW	.mxf	yes	no	
	NOTE Flame Premium uses Sony's SDK 2.3.1 to decode SonyRAW files. It includes support for Sony F65, F55, and F5 camera outputs.			
Sony SStP	.mxf	yes	no	
	NOTE Sony's implementation of MPEG-4 Simple Studio Profile, part of the SRMASTER format. The following Sony SStP formats are supported: ■ Lite (10-bit / YUV 422 / 220 Mbps) ■ SQ (10-bit / YUV 422 / 440 Mbps) ■ HQ (10-bit or 12-bit RGB 444 / 880 Mbps) These formats are supported in 1080PsF (23,97, 24, & 25), 1080i (50 & 59,94), and 720p (50 & 59,94).			
XAVC	.mxf	yes	yes	
	NOTE Includes support for Sony F55 and F5 camera, recorded in HD and 4K. Includes support for long-GOP files (Sony XAVC-Long format) such as recorded by the PXW-Z100.			

Format	Extension	Import	Export	Depth
XDCAM	.mxf	yes	no	
				NOTE MPEG-2 IMX 30, 40, and 50
XDCAM HD	.mxf	yes	yes	
				NOTE MPEG-2 long-GOP. Import supports 4:2:0 and 4:2:2. Export: 4:2:2.

NOTE Flame Premium exports MXF as OP-1a files (including the timecode). The is audio encoded as PCM, 16-Bit or 24-Bit. Avid applications support OP-Atom MXF files: use the AMA MXF plug-in to bring the OP-1a files into an Avid application.

MP4

Format	Extension	Import	Export	Depth
H.264	.mp4	yes	no	
XAVC-S	.mp4	yes	no	
XDCAM EX	.mp4	yes	no	
	NOTE MPEG-2 long-GOP			

Other Streaming Codecs

Format	Extension	Import	Export	Depth
AVCHD	.mts or .m2ts	yes	no	
	NOTE Only linear PCM audio is supported. Some cameras can record AC-3 audio, but this format is not supported. Only the video portion of AVCHD media with AC-3 audio content is accessible from Flame Premium.			
REDCODE	.r3d	yes	no	RAW
	Flame Premium uses RED SDK 5.3, including support monochrome R3D media and EPIC DRAGON footage.			

Audio File Formats

Format	Extension	Import	Export	Depth
AIFF	.aiff	yes	yes	16 or 24
AIFF-C	.aifc	yes	yes	16, 24, 32 (float)

Format	Extension	Import	Export	Depth
Audio Visual Research	.avr	yes	yes	16
Berkeley/IR-CAM/CARL Sound (BISCF)	.bsf	yes	yes	16
MP3	.mp3	yes	yes	16
Nextsnd	.au	yes	yes	16, 24, 32 (float)
WAVE	.wav	yes		16, 24, 32 (float)
WAVE - Broadcast	.wav	yes	yes	16, 24, 32 (float)
NOTE Includes support for RF64 files (BWF-compatible format that supports files larger than 4 GB).				
WAVE - Extensible	.wav	yes	no	16, 24, 32 (float)
NOTE Audio tracks are imported as regular audio tracks, without mapping the channels to spatial locations.				

NOTE Files of any sample rate can be imported, but they are all resampled to 48 kHz.

Soft-Imported Media

In a Visual Effects and Finishing application, soft-importing creates a clip that references unmanaged media. Unmanaged media typically resides on shared network storage, such as a SAN or NAS, where numerous applications can have equal access to it, avoiding data duplication. If soft-imported media is overwritten, the clip referencing it is updated accordingly. If soft-imported media is deleted, the clip referencing it displays a checkerboard pattern indicating that the media files can't be found. Inversely if, in the Effects or Finishing application, all clips referencing media are deleted, the source media remains unaffected. Basically, soft-imported media is unmanaged, whereas imported media is managed.

Published Media

Publishing consists of exposing managed or unmanaged media to a location accessible by other applications. Once published, the media is still being referenced in a clip library, just like any other clip, but automatically becomes soft-imported and unmanaged media. If the publish destination resides on the same volume and if the format of the published files is the same as the original file format, hard links to the managed media can be created as an option. This media is accessible to Lustre and unmanaged by the Effects and Finishing application.

If you are accessing media residing on a direct attached storage over a slow network connection via Wiretap, you may choose to publish your media to a shared network storage, which allows Lustre to access the media through a fast network storage connection. See [Sample Workflows](#) (page 705).

Mixed Media Support

A 'mixed' clip or timeline contains media of different storage formats. Typically, this kind of timeline contains both media from a Stone FS framestore and media soft-imported from a Standard FS framestore. In earlier versions, these clips could not easily be used by Wiretap clients without an explicit *stonifize* or publish from within the Visual Effects and Finishing application. As a result of server-side video media conversion, this is no longer necessary.

NOTE One limitation is that the frames within a given shot must be the same format throughout the shot. For example, a shot must have all Stone FS media or all .DPX media.

Proxy Media

A Lustre user can see proxy media on a Wiretap server by enabling the Half resolution button in the player. It is also possible to generate local proxies for Wiretap content. See [Project Menu Settings](#) (page 710) and [Viewing Local Proxies for Wiretap Media](#) (page 711). Lustre can create proxies as you are rendering the hires content to the Wiretap server by enabling the Proxy Rendering button within Network Rendering of the user configuration settings. See [Network Rendering Menu Settings](#) (page 711).

Sample Workflows

workflows:integrating Lustre into post-productionpost-production pipeline:integrating Lustre intoThe ability to access remote footage makes it possible for Lustre to share footage with other Autodesk products. The example workflows provided below offer high-level descriptions of how Lustre could be integrated into different post-production pipelines.

NOTE While Smoke is used in the examples, other applications such as Flame are equally applicable.

Workflow #1: Importing One-Sequence Clips

In the one-sequence workflow, you work with a single clip representing the timeline coming from Wiretap. In this case, files are first imported into Smoke from the Stone FS and assembled into a timeline created especially for Lustre. The timeline does not contain any splices or soft transitions. Lustre then accesses the timeline as a one-sequence clip by way of Wiretap. This workflow is particularly useful as a guide for a confidence check or scene detection.

NOTE A one-sequence clip appears as a single shot on the Lustre timeline and in the Library. You can perform a scene detection on the clip in order to break it down to its component shots. See [Using Scene Detection](#) (page 312).

In Lustre, you create local proxies, grade them, and then render the source clips back to the Stone FS using any of the standard Render mode controls in the Render Local menu. See [Specifying the Destination for Local Render Files](#) (page 596). The graded material is imported into Smoke to create an updated timeline to which finishing touches are applied prior to rendering the final clip.

Workflow #2: Importing Timeline

Importing a Timeline allows you to work with an editorial sequence that contains shots and soft transitions (such as dissolves). In this case, timelines are created in a Visual Effects and Finishing application and Lustre gains access to the timeline by way of Wiretap. This is a useful workflow for shot-to-shot grading.

NOTE The timeline includes information for all the segments in a clip, including the head and tail information for dissolve and splice events. When you load a Timeline clip, it auto-assembles, allowing you to bypass the conform step.

Lustre renders the final clip to local storage using one of the four rendering options in the Render Local menu. See [Specifying the Destination for Local Render Files](#) (page 596).

Workflow #3: Smoke Renders Final Version

Smoke and Lustre users each access the same files from the external SAN or NAS, and work on them simultaneously. The Smoke user assembles the files and creates a multi-layer timeline while grading is performed on the one-sequence clip in Lustre. At any time during the process, Smoke can be made to publish metadata to reflect editorial changes. Lustre can then be used to re-conform and create a new version of the timeline based on updates performed in Smoke. When grading is complete, the source clips are rendered by Lustre to the external storage using any of the standard Render Place controls in the Render Local menu. See [Specifying the Destination for Local Render Files](#) (page 596). The timeline can then be updated in Smoke by soft-importing the graded sources. Finishing touches are applied to the timeline in Smoke prior to rendering the final clip.

NOTE As an alternative to rendering to the SAN or NAS, Lustre could render to the Stone FS in order to allow Smoke users to bypass the soft-import step.

Workflow #4: Lustre Renders Final Version

As in the previous example, files are soft-imported into Smoke and Lustre in order to be worked on at the same time. The only differences are: instead of referencing the timeline as a one-sequence clip, it is referenced as an timeline; Lustre renders the final version of the timeline, instead of Smoke.

Workflow #5: Simple Source Grading

The following procedure illustrates a possible workflow for source grading for complex projects that include multi-layer timelines with numerous effects, transitions, etc. Since Wiretap flattens the timelines it imports from a Visual Effects and Finishing application, for complex projects, it is worthwhile creating a new single-layer timeline in the Visual Effects and Finishing application. In this way, all the material needed by the Effects and Finishing artists can be made available.

Workflow for simple source grading

- 1 In Smoke, capture and import media from the off-line editor as a timeline.
For greatest flexibility in the colour grading process, capture the material in A-mode or C-mode—that is, in ascending timecode sequence.
- 2 Create a timeline in Smoke that is especially for grading in Lustre, containing all the clips in a single video layer.

This can be accomplished most easily by selecting all the source clips needed in the clip library reel and performing a Load and Join operation.

- 3 In Lustre, use Wiretap to import the timeline created in the above steps.
- 4 Grade the sources in the imported timeline, then render it back, via Wiretap.
The rendered clips contain the updated grading but the same tape name and timecode information as the original clips.
- 5 In Smoke, create a copy of the multi-layer timeline—that is, the *destination* timeline.
- 6 Save the unlinked timeline to the clip library where Lustre has rendered the media, and relink.
The multi-layer timeline now contains the graded clips.

Preparing the Wiretap Timeline for Lustre

Before you can read a Visual Effects and Finishing timeline using Wiretap, the Visual Effects and Finishing artist must prepare the timeline.

To save a Wiretap timeline to a Visual Effects and Finishing clip library:

- 1 Process Timeline FX and transitions (see your Visual Effects and Finishing application's User Guide).
- 2 Save the timeline to the Clip Library.

NOTE When saving a timeline to the Clip Library for use in Lustre, the position of the focus point is important. See [Timeline Considerations and Restrictions](#) (page 694).
- 3 Exit the library by changing to a different clip library.
Exiting the library updates the information in the Visual Effects and Finishing database, making it available to Wiretap, and frees up the directory for read/write activity in Lustre.

Configuring Wiretap and Lustre

Before you begin using Wiretap with Lustre, some one-time configuration is required. Depending on how you will be using Wiretap, the following items might require configuration:

- Dual network support
- Wiretap server auto-detection
- Access to a shared storage mount point
- Soft-imported timelines

Configuring Dual Network Support

If your facility has both a GigE network and an InfiniBand network, you can configure Wiretap to use the high-bandwidth network for moving media, greatly improving network performance and increasing reliability. The behaviour is transparent to end-users.

The configuration is in the Wiretap configuration file `/opt/Autodesk/sw/cfg/wiretapd.cfg`.

```
[Server]
IP0=10.10.11.213
IP1=192.168.129.3
```

The IP address of the InfiniBand network must be first in the list, at IP0.

Restart the Wiretap server for your changes to take effect: `/opt/Autodesk/sw/sw_restart`.

Configuring Lustre to Work with Wiretap

When starting Lustre, Visual Effects and Finishing systems running Wiretap servers on the same network are detected and displayed in the Browser by default. The Wiretap Server can be identified by its host name or IP address, depending on how the workstation's network settings have been configured. You can edit the *init.config* file to configure Lustre to restrict what is displayed to a specified selection of Wiretap servers if you want to limit access.

The Configuration File

All Wiretap-related items are located in the *init.config* file, located in the following directories:

- `C:\Program Files\Autodesk\Lustre <version>` (Windows)
- `/usr/autodesk/lustre_<version>` (Linux)

To display a specified selection of Wiretap servers:

- 1 Open the *init.config* file in a text editor.
- 2 In the **<Wiretap>** section, change the Wiretap server auto-detection state to 'Off'.
<ServerAuto state="Off">

NOTE Settings in the *init.config* file are case-sensitive. You must use a capital 'O' when setting the auto-detection state to Off.

- 3 In the **<WiretapServerGroup>** subsection of the **<Wiretap>** section, add each Wiretap server's IP address or host ID to a separate **<WiretapServer String>** line.

NOTE The Wiretap server string lines must be inside the open and close comment tags of the **<WiretapServerGroup>** example.

For example, if your network uses DNS:

<WiretapServer string="berlin"/>

Otherwise:

<WiretapServer string="192.168.0.1"/>

You can add as many workstations as you need in this list. Just add one WiretapServer line for each workstation.

- 4 Save the *init.config* file and start Lustre.

Configuring the Wiretap Server to use a Shared Storage Mount Point

By default, Wiretap enables access to Visual Effects and Finishing media by way of the Wiretap server. However, if the applications share a storage mount point, Lustre can gain access to the media directly, while reading the metadata off the Wiretap server. You configure this behaviour by adding entries to the Wiretap *path translation file*.

Recall that the Linux and Windows operating systems present file path names using different syntaxes. For example, the path to network storage on a SAN that appears to a Windows workstation as **F:\SAN** might appear on Linux as **/SAN**. The path translation file ensures the path names are translated correctly as information moves between each application.

There are two main steps. First, determine how the shared mount point is seen by each system. Next, create a new translation rule-pair for each mount point in the Wiretap *path translation file*. In this way, you ensure that the Standard FS media used by a Visual Effects and Finishing timeline is directly read/write accessible in Lustre.

Note the following:

- The mount point/mapped network drives must already be set up in their respective operating systems before you refer to them in the path translation file.
- You can create translation rules on a host-by-host basis (most common), or on a per-platform basis. In situations where several hosts see their mount points in the same way, you can simplify the file by creating groups of hosts.
- Place each rule in the rule-pair on a separate line.
- Wiretap applies the rules in the order in which they appear in the file.

For complete information, see the *Autodesk Visual Effects and Finishing Installation and Configuration Guide*.

To configure the Wiretap path translation file:

- 1 On the workstation hosting the Wiretap server, open the Wiretap path translation configuration file, *wiretap_path_translation_db.xml*, using a text editor.

The file is located in the following directory:

/opt/Autodesk/wiretap/cfg

- 2 Scroll down to the section of interest, for example, the **Translation between two operating systems** section.
- 3 Copy and modify an existing entry, or enter your own rule-pair.

For example, the following rule-pair enables Lustre to read and write a shared mount point seen by the Linux workstation as /SAN, and by the Windows workstation as F:\SAN:

```
<map src_os="WindowsNT" src_path="F:\SAN" dst_os="Linux" dst_path="/SAN" />
```

```
<map src_os="Linux" src_path="/SAN" dst_os="WindowsNT" dst_path="F:\SAN" />
```

- 4 Save the *wiretap_path_translation_db.xml* file and restart the Wiretap server:

/opt/Autodesk/sw/sw_restart

Restarting the server is not essential, since the Wiretap server regularly polls the path translation file for changes. However, by restarting the server, you force it to be parsed. This is a good way to test the file for any XML syntax errors. Access to the mount points themselves is not tested during this phase.

Configuring for Soft-Imported Timelines

If you will be working with timelines containing soft-imported media, there are two configuration details to take care of. First, you must configure the Wiretap path translation table to permit the use of a shared storage mount point (as indicated in [Configuring the Wiretap Server to use a Shared Storage Mount Point](#) (page 708)). Next, you must correctly set up the directory structure on the shared storage mount point, as indicated in the following procedure.

To configure projects to access soft-imported timelines over Wiretap:

- 1 On the shared network storage system, such as a SAN or NAS, ensure that files to be soft-imported into the Visual Effects and Finishing application are all located in the same directory structure.

For example, the directory on the shared network storage system could be configured as follows:

/SAN/lustre/scans_full/2k/images/2048x1556/

Such a configuration is necessary in order for you to be able to render locally with Lustre.

- 2 On the Visual Effects and Finishing workstation where the Wiretap server is running, ensure the Wiretap path translation file contains entries to translate the paths to the shared mount points from one operating system to another.

This is necessary so that Lustre can have access to soft-imported media in Wiretap timelines.

See [Configuring the Wiretap Server to use a Shared Storage Mount Point](#) (page 708).

- 3 In the Lustre Project Management menu, ensure that the Scans Full Home path points to the Windows drive configured in the Wiretap path translation file (S:\), for example:

S:\lustre\scans_full\2k\images\2048x1556

All other project setup fields can be configured as usual.

- 4 The shared network storage system, such as the SAN or NAS, must be mounted and accessible (writeable) from both the Wiretap server host and Lustre workstation.

You are now ready to import soft-imported timelines by way of Wiretap.

TIP You can tell whether or not the directory has been properly translated by checking to see if the <Home> prefix appears as part of the shot information in the Library. See [Viewing Media File Information](#) (page 207).

Setting Up the Lustre Wiretap Project

projects:setting up for soft-imported clipsWiretap:setting up projects for soft-imported clips Lustre projects that make use of Wiretap must be configured differently than regular Lustre projects. The choices you make depend upon several factors. These factors include whether you will render locally or to a SAN or NAS (as can be the case in non-Wiretap setups), or use Wiretap to render to a Stone FS or Standard FS. In addition, you need to decide whether you will generate local proxies for the clips, or make use of proxies that might already exist on the Stone FS or Standard FS. If your project will make use of soft-imported media, additional considerations apply.

This section describes the settings for Lustre projects that make use of Wiretap, for all configurations other than those that use soft-imported media. For Wiretap projects that also make use of soft-imported media, see [Working with Soft-Imported Media](#) (page 715). For general considerations on setting up projects, see [Project Management](#) (page 45).

Project Menu Settings

The following table explains the criteria to consider for each of the fields in the Project menu related to Wiretap projects.

Field	Criteria
<i>Scans Full Home</i>	■ To access a Stone FS or Standard FS, this field should have the same path as <i>Project Home</i>. ■ To access 'published', unmanaged media (also called soft-imported media), populate this field with the path to the media residing on the shared network storage (for example, a SAN or NAS). For example, if the media is located in <i>F:/SAN/Project/001</i>, the <i>Scans Full Home</i> path should be <i>F:/SAN</i>.
<i>Scans Half Home</i>	■ To use proxies coming from a Stone FS or Standard FS, this field should have the same path as <i>Project Home</i>.

Field	Criteria
<i>Renders Full Home</i>	■ To render media to a Stone FS or Standard FS, browse to a clip library destination. This automatically sets the Wiretap render path. ■ To render media to a shared network storage device (for example, a SAN or NAS), browse to a shared network destination. See Rendering Shots (page 717).
<i>Renders Half Home</i>	■ To render proxy media to a Stone FS or Standard FS, browse to a clip library destination. This automatically sets the Wiretap render path. ■ To generate local proxies from media coming from a Stone FS or Standard FS, populate this field with the path to your local storage array. ■ To generate local proxies from Published content, populate this field with the path to the local storage array or shared storage network.

Rendering Menu Settings

If you are rendering to a Stone FS or Standard FS, enable the *Same Format As Scans* button. If you plan to render to shared storage, select the file format to be used (DPX, TIFF, etc.). Make sure the format you select is supported by the Wiretap server. See [Wiretap Gateway Supported Media File Formats](#) (page 192).

Network Rendering Menu Settings

To improve interoperability of projects used by Lustre and a Visual Effects and Finishing application, enable the *Proxy Rendering* button. Proxies are automatically generated when you render the timeline. This makes it efficient to load clips in a Visual Effects and Finishing application as you no longer have to render proxies first.

Viewing Local Proxies for Wiretap Media

As with non-Wiretap Lustre projects, proxy generation reduces processing time and can be helpful when working with large image formats. Wiretap projects will make use of Visual Effects and Finishing proxies, if available. This, nevertheless, involves transferring the proxies across the network. It can be advantageous to generate *local* proxies, regardless of proxy availability on the Visual Effects and Finishing side. Note that you can generate the local proxies at 100% of the original resolution. This allows you to work with high-resolution material on the local Lustre storage, avoiding network traffic without sacrificing image quality.

To view local proxies generated from the Wiretap media, enable the *Local Proxy* button in the Network Rendering menu (see [Network Rendering Settings](#) (page 78)). When this button is disabled, you will be able to see the original Visual Effects and Finishing Wiretap proxies using the network connection, upon import. Note that this will not work for clips already imported when the button was disabled.

Browsing for Remote Footage

editing:accessing the edit menuWiretap servers are displayed in the Lustre file browser as an IP address or server workstation name, followed by the Wiretap server version. When you manually open the Wiretap server entry in the browser, both Stone FS and Standard FS filesystems are visible.

▼ chorley		Autodesk IFFFS 2009.0.0
▶	stonefs	Free: 652.59GB Total: 1.59TB
▶	stonefs3	Free: 120.61GB Total: 144.64GB

(a) Wiretap server workstation name (b) Stone FS volume (c) Standard FS volume

For details on using the file browser, see [Accessing the File Browser](#) (page 203).

NOTE If you are unable to browse the remote filesystem, ensure the Wiretap service is functioning. See [Verifying Connectivity between Lustre and the Wiretap Server](#) (page 721).

Viewing the Volume Hierarchy

Expanding a Wiretap volume presents its contents as a hierarchy.

▼	chorley	Autodesk IFFFS 2009.0.0.beta6
▼	stonefs	Free: 658.26GB Total: 1.59TB
▶	DELETE	
▶	DJ_WIRETAP	
▼	HD_Proxy_On	
▶	16-bit	
▶	Default	(Read-Only)
▶	RENDERS	
▶	SD_SOFT	
▶	HD_v2008	
▶	HD_v2008_12bU	
▶	HD_v2009	

(a) Wiretap server (b) Free space on the file system (c) Read-Only indicator (d) Total space on the file system

The following information is presented:

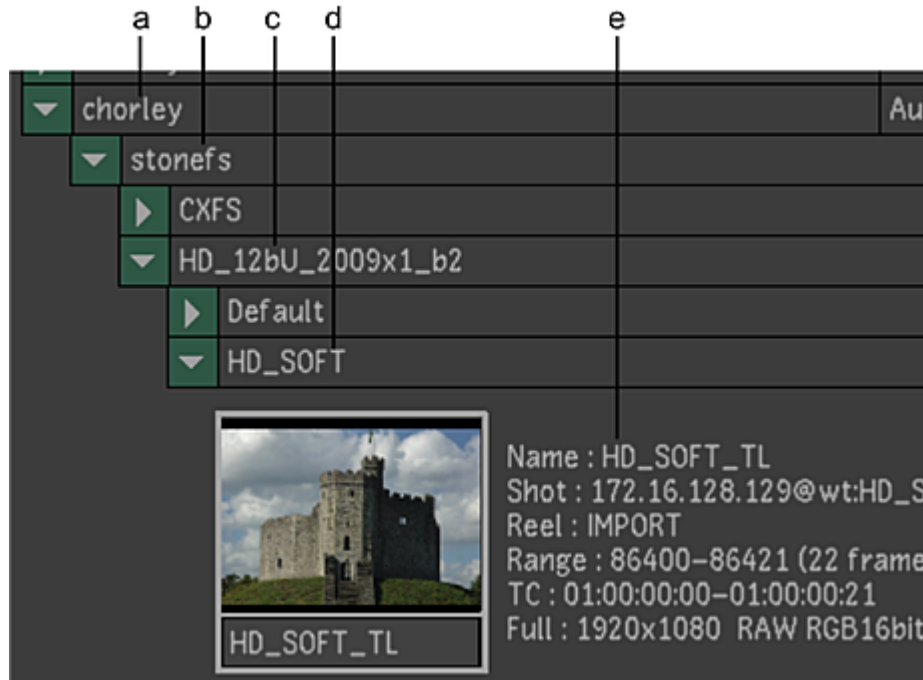
- Wiretap server
- Volume
- Project
- Library
- Reel (optional)
- Clip (in libraries and reels)

Note the following additional points:

- When you access a Wiretap server's volume in the file browser, the remaining space and the total space of the file server on the storage device is also displayed.
- *Read-Only* indicates the library is locked and new clips cannot be written to it. This is the case when a Visual Effects and Finishing artist is browsing the library, for example.
- In the browser, click Refresh to refresh the view of your filesystem.

Viewing Volume and Clip Details

Expanding the volume presents additional details.



(a) Wiretap server (b) Volume (c) Project (d) Library (e) Clip and Clip Metadata

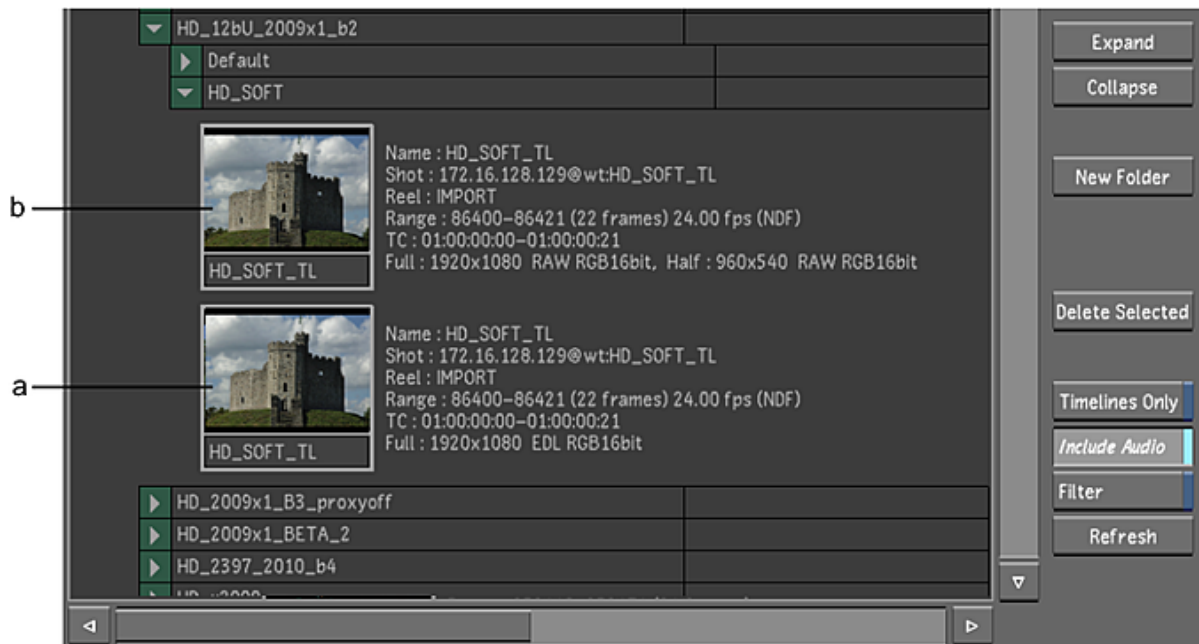
A detailed view of a Wiretap clip is represented in the Library and in the file browser with the following information:

- Clip name
- Shot location
- Frame range and timecode start/end
- Full and proxy resolutions
- Media type

For more information about viewing clip metadata, see [Viewing Media File Information](#) (page 207).

One-Sequence and Timeline Views

By default, the Timelines Only button in the Browser is enabled, which allows Wiretap content to be presented in a timeline form. You can also choose to display the one-sequence representation of the Wiretap timeline by disabling the Timelines Only button, in which case both the one-sequence and timeline versions are displayed at the same time.



(a) Timeline version (b) One-sequence version

The difference between the two is as follows:

- One-sequence: a sequence of files is presented to Lustre with clip metadata as opposed to timeline metadata and you can still see transitions as 'read-only'. This is useful, for example, when manually comparing the contents of the timeline against a digital cut captured directly from an offline video tape. See [Performing a Confidence Check](#) (page 310).
- Timeline: a sequence of shots that contains source clip metadata (for example, shot name, source timecode), dissolve, and cut transitions. This allows you to recreate the timeline that you had in your Visual Effects and Finishing application (in a single-layer format) when you import the Wiretap timeline. You can then grade each shot and render back either a single-sequence clip or render with the timeline structure intact.

Additionally, you can choose to display the clip thumbnails with or without details about the clips by enabling Details for a detailed view or Proxies for thumbnail-only view. For more information about the Browser, see [Accessing the File Browser](#) (page 203).

Importing the Wiretap Timeline

Please note the following points about importing footage from the browser:

- To maintain the editorial structure and transitions of the Wiretap timeline, it is recommended that you import the Wiretap timeline by dragging and dropping from the browser directly to the empty Storyboard area.
- If the Storyboard already contains a timeline, the new timeline is added as a layer above the existing layer(s). It is added at its record timecode position (not at the drop point), which contains the new timeline content.
- If the Storyboard or timeline is empty, importing a timeline from Wiretap automatically creates a cut. The name of the cut is the same as the name of the timeline.
- Source clips containing long tape names (more than seven characters) are supported.
- For long timelines, consider creating a new cut before dragging and dropping a clip from Wiretap. See [Creating a New Cut](#) (page 102).

- It is possible to load multiple timelines from Wiretap into different Lustre timeline layers (this is only applicable if you are using a Wiretap server version older than 2010 Extension 1). This is useful to create a timeline as it appears in the Visual Effects and Finishing application. In this case, the Visual Effects and Finishing artist must create multiple timelines, one for each layer. In Lustre, you manually load these into the current timeline. Lustre adds each layer based on the record timecode of the Wiretap timeline.
- Once the Wiretap timeline is regenerated as a Lustre timeline in the Storyboard, the source clips are automatically added to the Library.
- If you drag and drop the Wiretap timeline directly into the Library (as you would for local footage), only the source clips are imported into the Library. The timeline is not created in Lustre.
- By default, audio tracks are imported along with the timeline it is associated with. If you do not wish to import any audio over Wiretap, disable the Include Audio button. For more information about importing and playing back audio from Wiretap, see [Importing Audio From Wiretap](#) (page 685).
- Once shots are loaded into the Storyboard, information about the selected shot is displayed in the Shot Info field.



(a) Location of the Wiretap clip (b) Resolution of the clip (c) File format (d) Bit depth per channel (RGB)

Dust Bust and Marry Grade

It is possible to perform dust removal on media imported via Wiretap. However, since media stored on a Stone FS or Standard FS filesystem cannot be replaced by Lustre, you can create dust metadata for use when rendering media only.

NOTE The render options within the Image>Dust menu are inactive when media is imported from the Wiretap server or Wiretap Gateway. You can only render by using the Dust option within the Render>Local menu.

Media imported by Wiretap can also be used to generate Marry Grade data. However, since it is not possible to write Marry Grade files to Stone FS or Standard FS filesystems, the Marry Grade files are stored in the project's Full or Half Scan location. In the Marry Grade folder, a WT (Wiretap) folder is automatically created. Within it, a hierarchy of folders contain the Marry Grade data.

Working with Soft-Imported Media

This section presents the considerations that apply when working with timelines or clips containing soft-imported media. When using soft-imported media, be aware that you have no control if another user modifies the original media files. All soft-imported clips that refer to the modified media files are updated to reflect the change. Ensure that all users accessing the same media are aware of these implications.

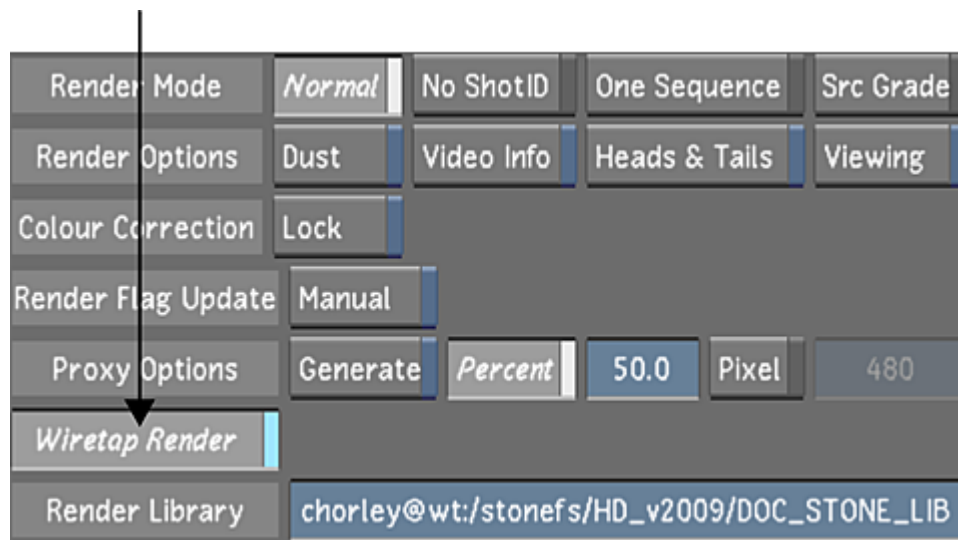
Creating Soft-Imported Links to Rendered Media

You can create soft-imported clips from rendered material and write the generated timeline back to the Wiretap Clip Library. The rendered results reside in the destination specified in the project settings, and a soft-import link is created on the Stone FS or Standard FS.

To create a soft-imported link to your graded renders in the Wiretap Clip Library:

- 1 Click Setup, and then click Project to display the Project menu.
- 2 In the Renders Full Home field, enter the path for the graded files to be rendered to.
For example, if your Windows drive is mapped to the network storage as S:\, then the renders full home path should be *S:/SAN/lustre_renders*.

NOTE The shared storage network (i.e., SAN or NAS) must be mounted and accessible from both the Wiretap Linux host and the Lustre workstation.
- 3 Click Render, and then click Local to display the Local menu.
- 4 Select one of the following render options:
 - Normal
 - No ShotID
 - One Sequence
 - Src Grade
- 5 Enter the path for the location of the soft-imported clip in the Render Library field.
For example, *10.145.43.31@wt:/stonefs/project/library*.
Note that you can set a default value for the Render Library field when configuring the project, as described in the next procedure.
- 6 Enable the Wiretap Render button.



- 7 Click Start.
This renders the files to the specific path of the shared network storage, and publishes the soft-import links to your rendered files in the destination Wiretap clip library. A new scene grade reel containing the soft-imported clips and/or timeline is created in the location specified by the Render Library field.

To set the Render Library path as a project setting:

- 1 From the Main menu, click Setup, and then Settings. Select the project to edit, and then click Edit in the Project group.
- 2 On the Network Rendering menu, enter the desired path in the Render Library field in either of the following ways:
 - Navigate to the directory using the navigation aid button and browser.

- Enter the desired path directly in the Render Library field, in the following format:

`<Wiretap_server>@wt:/<volume>/<project_name>/<library>`

For example:

rishikesh@wt:/stonefs/HD_project/lustresmoke

- 3 Save the settings for the project by clicking Save Project.
- 4 Click Exit Project.
- 5 To verify the path shows up as expected, from the Main menu, click Render, and then Local.
The path appears in the Render Library field.

Working with Stereoscopic Wiretap Timelines

Importing a stereoscopic Wiretap timeline follows all the principles and restrictions outlined for non-stereo Wiretap timelines (see [Importing the Wiretap Timeline](#) (page 714)). Similarly, once in Lustre, it is indistinguishable from a “local” stereoscopic timeline. Under specific circumstances, however, when rendered back to the Wiretap server, the timeline will lose its stereo status in the originating application. The status can easily be regained.

Recall that in an Autodesk Visual Effects and Finishing application, such as Smoke or Flame, the metadata must always be identical between the left and right eye layers. The layers must share the same resolution, bit-depth and frame rate. They must also be of the same duration, and have the same number of edits, in the same places. If the metadata falls out of sync, the timeline loses its stereo status.

However, in Lustre it is sometimes necessary to apply processing to just one layer of a stereo timeline. For example, applying a cut and animating the brightness channel can be a convenient technique for correcting a shot that becomes increasingly bright as it progresses. A cut applied to one layer but not the other puts the metadata out of sync, and the shot is no longer recognized as a stereo timeline, once rendered back to the Autodesk Visual Effects and Finishing application. It appears as a timeline with two layers, but without any of the stereo features or interface components.

When this arises, simply select the shot that caused the metadata to fall out of sync, and adjust it. Often this can be done in the originating application. In the case of an added cut, for example, you can “hard commit” the two shots involved. This renders the frames and eliminates the cut, “re-synchronizing” the metadata.

For other information on the Stereoscopy feature, see [Stereoscopy](#) (page 577).

Rendering Shots

editing:accessing the edit menuWhen you have finished grading the imagery from the filesystem, you can render to the local storage array, or write back to the Stone FS via Wiretap.

NOTE Audio tracks that were imported through the Wiretap server cannot be rendered back to Wiretap.

If working with soft-imported clips, you must also set up the directory structure on the SAN or the NAS in such a way that Lustre can recognize it. See [Setting Up the Lustre Wiretap Project](#) (page 710). You render clips from a local storage the same way as you would for any other clip. See [Rendering](#) (page 591).

Rendering clips back to Wiretap requires that the render destination be specified in the project setup. See [Setting Up the Lustre Wiretap Project](#) (page 710). The render destination you specify in the project setup will determine the location of the reel in which the rendered clip will be placed. See [Rendering with Wiretap](#) (page 718).

NOTE The clip’s long tape name metadata is also rendered back through Wiretap.

You can use the Render menus to render your work. You can render selected shots, all shots in a cut, a specific layer in the Timeline, or the flattened result of a multi-layer timeline. To prepare for rendering, do the following.

Rendering workflow:

- 1 Specify the layer to be rendered.
- 2 Set the resolution of the render files.
- 3 Set resize options, as needed.
- 4 Specify the destination for the render files.
- 5 Specify the output file format (if different than the original footage).
- 6 (Optional) Change the output colour space or specify an output LUT.
- 7 Set other options such as timecode burn-in and rendering with a viewing LUT.

Rendering with Wiretap

Wiretap:rendering optionsdestination, specifying render files forrendering:file destination, specifyingWhen rendering with Wiretap, a new reel (based on the scene name, grade, and timeline name) will be created in the destination Clip Library that was defined when the project was created. See [Project Management](#) (page 45).

This is the syntax to use when rendering to Wiretap, or publishing soft-import links to your graded sources:

```
<IP address or hostname>@wt:/<volume>/<project_name>/<library>
```

In the above sample, `<IP address or hostname>` is the IP address or host name of the Wiretap server. For a Stone FS, the volume is specified as *stonefs*. For a Standard FS, it is specified as *stonefs<#>*—for example, *stonefs2*.

If, for example, *10.145.43.31@wt:/stonefs/HD_project/rendered_grades* was entered in the Renders Full Home field, the rendered clip will be placed in:

```
/stonefs/HD_project/rendered_grades/<scene>_<grade>_<timeline_name>
```

You can specify how you want render files to be organized in the Wiretap Clip Library using the Render Place controls in the Render Local menu.

Normal Rendering Mode

A Normal render creates source clips (with or without head and tail frames) and a timeline. The extension of the timeline is the grade that the timeline is associated with (e.g., `<cut/timeline_name>_grd<number>`). In this mode, dissolves are rendered, and cannot be further modified in the Visual Effects and Finishing application.

For shots rendered to a Wiretap Clip Library, a new reel (based on the scene name, grade, and timeline name) is generated in the Clip Library that was defined when the project was created. This is where the rendered material is placed.

For example, if *10.145.43.31@wt:/stonefs/tutor/lustregrades* was entered in the Renders Full Home field, the graded rendered shots are placed in *10.145.43.31@wt:/stonefs/tutor/lustregrades*. These shots contain the clip name, grade name, and the shot's unique ID.

```
<clip_name>_<grade>_<unique_id> (example:shot1_grd14_AB3E9770000053)
```

An additional clip with a `_grd<number>` suffix is also generated containing the cut or timeline name. For example, if the grade name is *grd14* from the timeline called "interior_003", the additional file is:

```
interior_003_grd14
```

The graded timeline is generated based on the new rendered source files.

No ShotID Rendering Mode

As outlined in the Normal mode description above, when rendering clips to Wiretap, a new reel (based on the scene name, grade, and timeline name) is created in the Wiretap Clip Library and all rendered material is placed there. The additional clip with the `_grd<number>` suffix is also generated.

One-Sequence Rendering Mode

As with Normal and No ShotID mode, when rendering clips to Wiretap, a new reel (based on the scene name, grade, and timeline name) is created in the Wiretap Clip Library and all rendered material is placed there.

One-Sequence mode generates one clip of the graded sequence containing the Lustre cut or timeline name and the grade number. If, in Lustre, your scene is named *interior_003*, the timeline is named *FINAL_CUT*, and the grade file is named *grd14*, the new reel in the Wiretap Clip Library will be called:

`/stonefs/HD_project/rendered_grades/interior_003_FINAL_CUT_grd14/`

The rendered, one-sequence clip will contain the grade name: *FINAL_CUT_grd14*

Source Grade Rendering Mode

Src Grade mode renders the complete timeline back to Wiretap with Lustre grading applied, but dissolves and retimes are rendered as soft effects with modifiable values. This is the most convenient rendering mode for regenerating source clips for relinking in the Visual Effects and Finishing application, in a “simple source grading” workflow.

For shots rendered to Wiretap, a new reel (based on the scene name, grade, and timeline name) is generated in the library that was defined when the project was created. This is where the rendered material is placed.

For example, if `10.145.43.31@wt:/stonefs/tutor/lustregrades` was entered in the Renders Full Home field, the graded rendered shots are placed in `10.145.43.31@wt:/stonefs/tutor/lustregrades/scene_grade`. These shots contain the clip name, grade name, and the shot's unique ID.

`<clip_name>_<grade>_<unique_id>` (example: *shot1_grd14_AB3E9770000053*)

An additional clip with a `_grd<number>` suffix is also generated containing the cut or timeline name. For example, if the grade name is *grd14* from the timeline called “interior_003”, the additional file is:

interior_003_grd14

The graded timeline is generated based on the new rendered source files.

Rendered graded source files are renamed according to the grade number and the clip's unique ID. For example: *grd01_4323B1F4*.

Rendering Wiretap Clips to Local or Network Storage

The render directory structure for Wiretap clips is different from how local scans are rendered to the local or networked storage. The location and structure of the *scene* or *grd* directory depends on whether your shots are written on the Stone FS, or soft-imported into the Stone FS, and is based on your project directory structure. See [Setting Up the Lustre Wiretap Project](#) (page 710).

You can specify how you want render files to be organized under the *grd* or *scene* directory using the Render Place controls in the Render Local menu. These controls affect the location where they are saved and the naming scheme of the render files.

NOTE There is currently no difference between Normal and No ShotID renders.

To set how render files are organized:

- 1 Enable Normal, No ShotID, One Sequence, or Src Grade.

NOTE Soloing and Muting rules for Wiretap rendering are the same as those for local rendering. See [Specifying the Destination for Local Render Files](#) (page 596).

Normal Rendering Mode

Clips are rendered to sub-directories of a directory based on the scene name, which Lustre creates automatically when you first render shots. From there, they are rendered with each shot in its own *grd_UID* directory, creating the final name by combining the grade name with the scene name.

For example:

Stone-based clips are rendered as:

```
<Home>/<scene>/grd/<grdXX_UID>/<resolution>/<scene_grdXX.xxxx>.dpx
```

Soft-imported clips are rendered to a directory called *grd*. With this *grd* directory, all the shots are rendered to a single directory based on the source location of the soft-imports (let's call it the source reel) and the grade name. From there, the final name is created based on the source filename and Lustre grade name.

For example:

Soft-imported clips are rendered as:

```
<HOME>/grd/<sourcereel_grdXX_UID>/<resolution>/<origfilename_grdXX_UID.xxxx>.dpx
```

If a source clip called *shot13* has been soft-imported into the Effects or Finishing application from this location:

```
/SAN/lustre/scans_full/2k/reel23/2046x1556/
```

Lustre then imports this soft-imported clip via Wiretap, saves the grade as *grd01*, and renders it to the local or networked storage array. Lustre will take the name of the shot directory preceding the resolution directory, in this case, *reel23*.

For example:

Soft-imported clips are rendered as:

```
<HOME>/grd/reel23_grd02_AB3E9770000053/2046x1556/shot13_grd01_4323B1F4.0001.dpx
```

No ShotID Rendering Mode

As with Normal renders, Stone-based clips are rendered to sub-directories based on the scene name, which Lustre creates automatically when you first render shots. From there, they are rendered with each shot in its own *grd_UID* directory, creating the final name by combining the grade name with the scene name.

For example:

Stone-based clips are rendered as:

```
<HOME>/<scene>/grd/<grdXX_UID>/<resolution>/<scene_grdXX.xxxx>.dpx
```

As with Normal renders, soft-imported clips are rendered to a directory called *grd*. With this *grd* directory, all the shots are rendered to a single directory based on the source location of the soft-imports (let's call it the source reel) and the grade name. From there, the final name is created based on the source filename and Lustre grade name.

For example:

Soft-imported clips are rendered as:

<HOME>/grd/<source reel_grdXX_UID>/<resolution>/<origfilename_grdXX_UID.xxxx>.dpx

One Sequence Rendering Mode

As with Normal and No ShotID renders, clips are rendered to sub-directories of a directory based on the scene name, which Lustre creates automatically when you first render shots. From there, under the sub-directory called *grd*, the shots are rendered as a single sequence to a directory based on the *grd* name. The filenames consist of the scene name, the grade name, and a sequential number. There are no UUIDs in the directory naming scheme.

Soft-imported clips are rendered to sub-directories based on the scene name, which Lustre creates automatically when you first render shots. From there, under the sub-directory called *grd*, the shots are rendered as a single sequence to the sub-directory based on the *grd* name. The filenames consist of the scene name, the grade name, and a sequential number. There are no UUIDs in the directory naming scheme.

For example:

Stone-based clips are rendered as:

<HOME>/<scene>/grd/<grdXX>/<resolution>/<scene_grdXX.xxxx>.dpx

Soft-imported clips are rendered as:

<HOME>/<scene>/grd/<grdXX>/<resolution>/<scene_grdXX.xxxx>.dpx

Source Grade Rendering Mode

As with Normal and No ShotID renders, clips are rendered to sub-directories based on the scene name, which Lustre creates automatically when you first render shots. From there, they are rendered with each shot in its own *grd_UID* directory, creating the final name by combining the grade name with the scene name. In addition, Src Grade excludes dissolves and retimes and renders the files with their pre-dissolve and pre-ptime handles.

Stone-based clips are rendered as:

<HOME>/<scene>/grd/<grdXX_UID>/<resolution>/<scene_grdXX.xxxx>.dpx

As with Normal and No ShotID renders, soft-imported clips are rendered to a directory called *grd*. With this *grd* directory, all the shots are rendered to a single directory based on the source location of the soft-imports (let's call it the source reel) and the grade name. From there, the final name is created based on the source filename and Lustre grade name. In addition, Src Grade excludes dissolves and retimes and renders the files with their pre-dissolve and pre-ptime handles.

Soft-imported clips are rendered as:

<HOME>/grd/<source reel_grdXX_UID>/<resolution>/<origfilename_grdXX_UID.xxxx>.dpx

Troubleshooting

This section presents a few helpful procedures relating to the Wiretap server and Lustre-server connectivity.

Verifying Connectivity between Lustre and the Wiretap Server

Verify that you have proper connectivity over the network.

To verify connectivity (Windows):

- 1 On your Lustre workstation, click the Start button, and then click Run.

- 2 In the Run dialog box, type:

cmd

A command console is displayed.

- 3 In the command console, type:

ping <IP address of Wiretap host or Wiretap host workstation name>

Example system response

ping computer

Reply from 172.16.128.129: bytes=32 time=3ms TTL=63

Reply from 172.16.128.129: bytes=32 time=3ms TTL=63

Reply from 172.16.128.129: bytes=32 time=3ms TTL=63

A system response with ping times similar to the example, above, indicates that your Lustre workstation can see the remote Wiretap host workstation.

To verify connectivity (Linux):

- 1 On your Lustre workstation, open a shell and type:

ping <IP address of Wiretap host or Wiretap host workstation name>

Example system response

ping computer

Reply from 172.16.128.129: bytes=32 time=3ms TTL=63

Reply from 172.16.128.129: bytes=32 time=3ms TTL=63

Reply from 172.16.128.129: bytes=32 time=3ms TTL=63

A system response with ping times similar to the example, above, indicates that your Lustre workstation can see the remote Wiretap host workstation.

Starting and Stopping the Wiretap Server

The following utilities have been provided for starting, stopping, and restarting the Wiretap server.

Utility	Description
<i>sw_start</i>	Starts the Wiretap server
<i>sw_stop</i>	Stops the server
<i>sw_restart</i>	Stops then restarts the server

The utilities are located in the following directory:

/opt/Autodesk/sw

Verifying that the Wiretap Server is Running

To verify a Wiretap server is running:

- 1 On the Wiretap server, open a shell and type:

ps -ef |grep wiretap

Example system response

```
root 19579 10 May14 ? 00:00:00 /bin/sh /opt/Autodesk/sw/sw_wiretapd
```

```
root 19588 195790 May14 ?00:01:51 /opt/Autodesk/wiretap/<version_number>/ifffsWiretapServer -c  
/opt/Autodesk/wiretap/cfg/wiretapd.cfg
```

```
root27965 277280 10:02 pts/5 00:00:00 grep wiretap
```

In the above output, the line `/opt/Autodesk/wiretap/<version_number>/ifffsWiretapServer -c /opt/Autodesk/wiretap/cfg/wiretapd.cfg` indicates the version number of Wiretap that is running. If you do not see information similar to this, restart the Wiretap server.

Keyboard Shortcuts

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Storyboard Navigation

hot keys:navigating the StoryboardStoryboard:hot keysUse these keyboard shortcuts to navigate in the Storyboard and shot timebars.

Press:	To:
Up Arrow	Play forward.
Down Arrow	Play backward.
Left Arrow	Go to the first frame of the previous shot.
Right Arrow	Go to the first frame of the next shot.
Spacebar	Toggle Play/Stop.
Shift+Spacebar	Switch to Render View mode, switch off the user interface, and start playback.
Right Ctrl	Step one frame forward.
Right Alt	Step one frame backward.
Shift+I	Mark an in point for loop play on the Scene timebar.
Shift+O	Mark an out point for loop play on the Scene timebar.
Shift+L	Clear in and out points from the Scene timebar.
. (decimal point on the numeric keypad)	Cycles through the play modes (loop sequence, loop shot, and loop in and out).

Press:	To:
Tab	Toggle the Storyboard on/off. In the Editing menus, the Storyboard is always on.
Q	Switch between Storyboard viewing modes (regular and large Storyboard view) in the Editing menu.
Alt+Q	Change Thumbnail Size (Small/Large).
Ctrl+Q	Single/Dual Large Storyboard View
Shift+l	Enable or disable the Update Storyboard feature. When enabled, the Storyboard is automatically updated as you make changes to your shot.
. (period)	Update the shot's thumbnail according to the colour correction applied on the shot.
Shift+. (period)	Regenerates multiple Storyboard thumbnails consecutively, starting from the current shot.
Ctrl+.	Save Thumbnail to disk.
Spacebar	Stop the multiple Storyboard thumbnail regenerating procedure.
Middle-drag	Pans the Storyboard.
F	Toggle between the collapsed Storyboard and the original.
Middle button+Right button-drag	Zoom In/Out Viewer.
Alt+click on SDI button	AJA SDI Low Latency Mode.

View Modes

hot keys:switching view modesview modes:hot keysUse these keyboard shortcuts to switch between the different view modes.

Press:	To:
I	Input View.
O	Output View.
P+	Print View.
F11	Matte View (White over Black / Grayscale).
~ (tilde)	Schematic View.

Press:	To:
F12	Show Result NOTE Toggle the Output view from the Matte view. Used mostly for quick switching when tweaking mattes (F11/F12).
F1	Display Playhead A.
F2	Display Playhead B.
L	Framestore View .
K	Save Frame to Framestore.
Shift+P	Reparse Prints.
Shift+K	Load Reference Image
Enter	GUI (ON/Off).
Ctrl+F1	Colour View (Red, Green, Blue, Luminance).
Ctrl+Shift+F1	Previous Colour View.
F3	View Modes (Single, Dual, Multi-View).
Shift+F3	Previous View Mode
F4	A/B Dual View Modes (2-Up, Horizontal Wipe, Vertical Wipe).
Shift+F4	Previous Dual View Mode.
Ctrl+F4	Stereo3D Dual View Modes (2-Up, Horizontal Wipe, Vertical Wipe).
Shift+Alt+F4	Previous Stereo3D Dual View Mode.
F5	Single View / Current View Mode Toggle.
Ctrl+F5	Multi-View Modes (2,4,9 and 16 Viewers).
Ctrl+Shift+F5	Previous Multi-View Modes.
F6	Refresh Multi-View.

Press:	To:
F7	SDI Output Mode (GFX SDI).
Ctrl+F7	Screen Grab (AJA SDI).
J	Video Preview (On/Off).
F8	GUI Update While Playback (On/Off).
F9	Full/Half Resolution.
F10	1x / 2x Zoom Toggle.
Ctrl+F	Viewer Filtering (On/Off)
Shift+~ (tilde)	Toggle Between Black and Defined Background Colour.
B	Library/Browse View Modes (Proxies, List, Details).
V	Ratio (On/Off).
W	On-Screen Display (On/Off).
Ctrl+W	Toggle On-Screen Display Size.
Alt+Shift+W	Shot Name / Notes On-Screen Display (On/Off).
Alt+Ctrl+W	Notes On-Screen Display (On/Off).
Ctrl+Shift+W	Flags On-Screen Display (On/Off).
Alt+W	Toggle Flags On-Screen Display Position.
Alt+1	RGB Waveform Monitor (On/Off).
Alt+2	RGB Histogram (On/Off).
Alt+3	Luminance Waveform Monitor (On/Off).
Alt+4	Vectorscope Monitor (On/Off).
' (apostrophe)	Sub-Region Calculating
E	Colour Picker Mode (Code Values, F-Stop, HDR).

Press:	To:
Z	Dust Removal Boxes (Show/Hide).
H	Overlay (On/Off)

Timeline Sort Modes

Use the following keyboard shortcuts to sort the shots in your timeline.

Press:	To:
Alt+F9	A-Mode Sort (Include Heads & Tails).
Alt+F10	A-Mode Sort.
Alt+F11	C-Mode Sort (EDL Reel Name) (Include Heads & Tails).
Alt+F12	C-Mode Sort (EDL Reel Name).
Ctrl+Alt+F11	C-Mode Sort (Folder Name) (Include Heads & Tails).
Ctrl+Alt+F12	C-Mode Sort (Folder Name)
Ctrl+Alt+Shift+F11	C-Mode Sort (DPX Reel Name) (Include Heads & Tails)
Ctrl+Alt+Shift+F12	C-Mode Sort (DPX Reel Name).
Alt+F8	Disable Sort Mode.

Notes

hot keys:assigning notes to shotsnotes:hot keysYou can use any of the following standard text editor functions when drafting notes in the Notes window.

Press:	To:
cursor arrows	Move up, down, left or right.
Ctrl+A	Select all text.
Shift+cursor arrow or left mouse button-drag	Select text.
Backspace, Delete	Delete text.
Home	Jump to the start of the current line.

Press:	To:
Ctrl+Home	Jump to the start of the text.
End	Jump to the end of the current line.
Ctrl+End	Jump to the end of the text.
Page Up	Jump one text screen up.
Page Down	Jump one text screen down.
Ctrl+A	Select all text.
Esc or click outside the text editor	Exit Text Edit Mode.

Calculators

hot keys:using calculatorscalculator:hot keysThe following keyboard shortcuts can be used with the standard calculator and the timecode calculator.

Press:	To:
Backspace	Erase the last digit in the calculator's numeric field.
Delete	Reset the calculator's numeric field to zero.
Page Down	Toggle Positive / Negative Numeric Value.
Up cursor arrow	Add the current calculator value to the field or slider value.
Down cursor arrow	Subtract the current calculator value from the field or slider value.
Enter or click the calculator's active numeric field	For the standard calculator: calculate the value, apply it to the field or slider, and close the calculator. For the timecode calculator: jump to the frame number that corresponds with the value entered in the calculator's numeric field.
Enter or click the calculator's = (equals) button	Calculate the value and display the result without applying it to the field or slider. Applicable to the standard calculator only.
Ctrl+Enter or right-click the calculator's = (equals) button	Calculate the value, display the result, and apply it to the field or slider. Applicable to the standard calculator only.
Esc or click outside the calculator	Close the calculator and leave the field or slider value unchanged. Applicable to the standard calculator only.

Dust Removal

hot keys:removing dustdust removal:hot keysUse these keyboard shortcuts when working in the Dust menu.

Press:	To:
Shift+ Mouse click in Viewer	Add One Point Repair Box.
Z	Show or hide the dust removal boxes.
, (comma)	Show or hide the dust removal boxes.
Backspace	Delete the active Dust Box.
Shift-click (Shot button)	Render dust removal results in all shots in the timeline that have been modified (rather than the current shot only).

Grain Removal

hotkeys:removing graingrain removal:hotkeysUse these keyboard shortcuts when working in the Degrain menu.

Press:	To:
Z	Enable / Disable Sub-Region Analysis.
, (comma)	Enable / Disable Sub-Region Analysis.
Backspace	Delete the active degrain analysis sub-region boxes.
Right Mouse Click on Boxes	Select or de-select multiple degrain analysis sub-region boxes.

Editing

hot keys:editingediting:hot keysCertain editing keyboard shortcuts are available from any menu, whereas the rest are available exclusively from the Edit menu.

Global Editing Shortcuts

When you enable the Editing While Grading button in the System & Menu page of the user configuration, you can access the following editing keyboard shortcuts from any Lustre menu (except the Colourist Timeline).

Press:	To:
Shift+C	Add a Cut.

Press:	To:
Shift+J	Remove Cut (Match Frame Edit).
Shift+T	Start interactive visual trimming.
Shift+R	Start interactive visual sliding between the current and the previous Shot.
Shift+S	Start Scene Detection.

Edit Menu Shortcuts

Use these keyboard shortcuts in the Edit menu.

Press:	To:
Shift+D	Delete Current Shot.
Shift+Q	Match Shot in Library.
Alt+Mouse Click on Library Clip	Reverse Match.
Esc	Exit visual interactive trimming, interactive slipping, and Scene Detection.
Shift+Drag Clip over Storyboard.	Replace the shot.
Shift+hold-drag	Replace the shot with an offset.
Enter (on numeric keypad)	Confirm and exit Shot Replace mode.

Timeline Menu Shortcuts

Use these keyboard shortcuts in the Timeline menu when your cursor is on the Timeline canvas.

Press:	To:
Up Arrow	Move focus up.
Down Arrow	Move focus down.
Shift+M	To mute or unmute the track on the focus layer.
T	Trim Mode (On/Off).
Enter	Toggle Viewer/Library and Media Browser.

Press:	To:
Alt+C	Copy Segment .
Alt+S	Solo Mode (On/Off).
Shift+Mouse Drag	LCopy Segment and Constrain Paste.
Shift+C	Add a Cut.
Shift+J	Remove Cut (Match Frame Edit).
Shift+D	Delete Current Shot.
, (comma)	Slip Mode (On/Off).
Ctrl+ Mouse Click on Timeline Canvas	Timeline Home View.
Alt+H	Zooms into the selected shot(s).
Middle Mouse Button Click+Drag	Pans the Timeline left or right.
Right-click-drag	Zooms in and out of the Timeline.
Shift + Click (Start/End of shot).	Continuous selection.
Ctrl + Click Shots	Select multiple elements that are not in continuous order.
Shift+N	Duplicate selected shot.
S	Save cut.
Shift+R	Toggles the Ripple mode (Off/Start/End).
]	Zooms out of the Timeline. Zoom is centred on the playhead.
[	Zooms in on the Timeline. Zoom is centered on the playhead.
D	Add Dissolve.
Shift+ /	Shot Priority (On/Off) on current shot
Shift+Right-Click on Shot	Shot Priority (On/Off) on any shot
Ctrl+Shift+~ (tilde)	Create Container from selection.

Press:	To:
Ctrl+'	Create Matte Container from selection
Shift+"(quotes)	Swap Shot (selection).

VTR Capture & Playout Menu Shortcuts

Use these keyboard shortcuts during the capture process.

Press:	To:
Esc	Pause VTR Capture.
Esc (Press twice)	Cancel VTR Capture.
E	Restart VTR Capture
S	Skip the current tape.
Backspace	Delete the last digit of the current timecode value.
Shift+ Click Insert button	Single Shot VTR Insert Edit.
Shift+ Click Assemble button	Single Shot VTR Assemble Edit.

Colour Grading

hot keys:colour gradingcolour grading:hot keysUse colour grading keyboard shortcuts to perform colour grading operations carried out in the Grading, Curves, and Secondaries menus.

Global Colour Grading Hotkeys

Use these hotkeys in any of the Colour menus.

Press:	To:
C	Copy the parameters in the Selector tool from the current shot to the selected shot(s).
Ctrl+ Click on Parameters Fields in the Selector	Clear Selector Parameters Selection.
R	Reset the current Grading menu parameters .
RR	Reset all parameters.

Press:	To:
U	Undo
Ctrl+Z	Undo
S	Save the current grade files and cut. If a grade file has not been created, a default grade file is saved.
G	Switch between Gang and Solo mode when in Group mode.
Y	Enable/disable GPU acceleration.
Ctrl (left)+H	To hide or show the selected geometry.
Page Up (Secondaries menu)	Increase the Hue Rotator value.
Page Down (Secondaries menu)	Decrease the Hue Rotator value.
Page Up (other menus)	Go to the Saturation curve in the Curves menu.
Insert	Go to the Hue curve in the Curves menu.
Home (Secondaries menu)	Increase the saturation of a secondary when a layer is enabled, or of the entire image when either the Input or Output button is enabled.
Home (other menus)	Go to the Lightness curve in the Curves menu.
End (Secondaries menu)	Decrease the saturation.
Ctrl+click Delete button	Delete Grade from Grade Bin without confirmation.
Print Scrn	Go to the Grading menu.
Scroll Lock	Go to the Secondaries menu. Press it again to go to the next secondary.
Right Mouse Click on Grading, Curves, Secondaries or Degrain menus.	Display the preset menu.
/ (slash)	Auto-grade with the Balance Input Primaries for the selected colour. The master (brightness or lift/gain) is not modified. You can auto-grade the master as well by Ctrl-clicking the image.
Click in the Viewer	Sample the colour at the current position.
	NOTE The Show button must be disabled for this to work.

Press:	To:
Shift-drag	Drag an area to calculate this area's mean colour, and show it in the colour picker. In monitoring view, this defines the sub-region as well. If you picked a colour, you can then perform colour matching. NOTE The Show button must be disabled for this to work.
Alt-click	Sample an individual pixel and set the Brightness Balance wheel to match the reference sample. You can drag through the image until you locate the pixel you want to sample, then Alt-click.
Ctrl-click	Sample an individual pixel and set the Brightness Balance wheel and Brightness slider to match the reference sample. You can drag through the image until you locate the pixel you want to sample, then Ctrl-click.

Grade Bin Hotkeys

Use these keyboard shortcuts for the Grade bin.

Press:	To:
Shift+- (hyphen)	Cycle between Grade bin locations (cursor must be outside file browser or expanded Grade bin).
Double-click	Load all the settings for the selected preset thumbnail to the current shot only.
Right-click	Save the stored image to the framestore.
Shift-double-click	Load all the settings for the selected preset thumbnail to selected shots.
Ctrl-double-click	Load current menu settings for the selected preset thumbnail to the current shot only.
Ctrl+Shift-double-click	Load current menu settings for the selected preset thumbnail to a selection of shots.
Alt-double-click	Load specified parameters in the Selector to the current shot only.
Alt+Shift-double-click	Load specified parameters in the Selector to a selection of shots.
Shift+- (The "-" key next to the "0" on the keyboard)	Cycle Grade Bin / Preset Locations (Global, Project, Scene, etc).
Shift+Alt+S	Save Selected to Grade Bin.

Expanded Grade Bin Hotkeys

Use these keyboard shortcuts for the expanded Grade bin.

Press:	To:
Right-click	Edit a note in the List view.
Shift+- (hyphen)	Cycle between expanded Grade bin locations (cursor must be over file browser or expanded Grade bin).
Shift-click	Select contiguous grade files.
Ctrl-click	Select multiple grade files.
Ctrl-drag	Copy a grade file to a Grade bin storage container.
Shift-double-click	Load all the settings for the selected grade file to selected shots.
Ctrl-double-click	Load current menu settings for the selected grade file to the current shot only.
Ctrl+Shift-double-click	Load current menu settings for the selected grade file to a selection of shots.
Alt-double-click	Load specified parameters in the Selector to the current shot only.
Alt+Shift-double-click	Load specified parameters in the Selector to a selection of shots.
Shift+- (The "-" key next to the "0" on the keyboard)	Cycle Grade Bin / Preset Locations (Global, Project, Scene, etc).
Shift+Alt+S	Save Selected to Grade Bin.

Secondary Layers Hotkeys

secondary layers:hotkeyshotkeys:secondary layersUse these keyboard shortcuts when working with the secondary layer panel.

Press:	To:
1, 2, 3, 4, 5, 6, 7, 8, 9, 0, -, =	Select a secondary layer (1-12, 13-24, 25-36, or 37-48).
\	Activate/deactivate the selected secondary layer.
Ctrl+(1, 2, 3, or 4)	Select the secondary layers page 1, 2, 3, or 4.
Scroll Lock	Cycle through all the activated secondary layers.

Press:	To:
Ctrl-click secondary layer button	Copy the grading information from the current menu (e.g., Grading, Curves, or Secondaries) to the selected secondary layer.
Shift-click secondary layer button	Copy all the colour grading information to the selected secondary layer.

Curves Menu Hotkeys

Use these keyboard shortcuts in the Curves menu.

Press:	To:
A	Add a vertex to the mouse position in the current curve.
Shift+A	Lock the curve in place while adding a vertex.
D	Delete the selected vertex from the current curve.
R	Reset the current shot's curve parameters to the default setting.
Right-drag	Zoom in or out.
Middle-drag	Pan the curve.
Alt-drag	Zoom in on a curve using rectangle zoom.
Alt-right-drag	Zoom in on a curve using proportional zoom.
Ctrl (right)-left-click	Reset the curve zoom in/out properties to the default setting.
Ctrl (right)-right-click	Reset the curve viewer.
Shift-drag	Restrict movement of selected vertices to the Y axis.
Shift+Alt-drag	Restrict movement of selected vertices to the X axis.

Secondaries Menu Hotkeys

Use these keyboard shortcuts in the Secondaries menu.

Press:	To:
, (comma)	Show or hide a geometry.
R	Reset all secondary colour correction parameters for the current shot.

Press:	To:
Shift+D	Enable Del Geom, and then delete a geometry.
A	Enable Add Pts, and then add vertices to a geometry.
D	Enable Del Pts, and then delete vertices from a geometry.
Z	Enable the Rotate button, and then click on the geometry's axis to rotate.
Right-click-drag	Rotate the geometry when you right-click its axis and drag.
Click-drag (on Z-axis)	Proportional scale left.
T	Enable the Move button, and then move a geometry's axis, vertex, or tangent.
X	Enable the Scale button, and then scale a geometry. You can scale a geometry along the X-axis, Y-axis, or you can scale it proportionally using the Global Scaling axis.
Backspace (tracking)	Delete the latest tracked position.
Right-click (basic geometry)	Convert a basic geometry to a free-form geometry.
Ctrl-click (free-form geometry)	Break or repair a tangent handle when you click one of the geometry's vertices.
Alt-right-click	Offset the axis.

Timeline Menu Hotkeys

hotkeys:colourist timeline Use these keyboard shortcuts in the colour grading Timeline menu.

Press:	To:
Shift+C	To make a cut in an element.
Alt+S	Enable or disable Solo mode.
Up Arrow	Move the focus up.
Down Arrow	Move the focus down.
F7	Displays the timeline, Player, grading tools, and keyer (HLS or Diamond). Also activates the SDI out if the GFX SDI is enabled.
Ctrl+drag+drop	Drag and drop the grade from one shot to another.

Press:	To:
Ctrl+Shift+drag+drop	Drag and drop the grade from one shot to a selection of shots.
Ctrl+Alt+drag+drop	Drag and drop the Selector parameters to one shot.
Ctrl+Alt+Shift+drag+drop	Drag and drop the Selector parameters to a selection of shots.

Numeric Keypad

hot keys:numeric keypadThe numeric keypad shortcuts vary depending on the menu. The following section includes shortcut tables for the following menus:

- Colour—Grading and Secondaries menus
- Editing—Edit menu
- Editing—Capture and Playout menus

Colour Menus Grading and Secondaries

hot keys:colour gradingcolour grading:hot keysRefer to the following table for numeric keypad shortcuts functions when working in the Grading and Secondaries menus.

Press:	To:
1	Decrease cyan brightness by 1 point.
Shift+1	Decrease cyan brightness by 1/2 point.
2	Decrease magenta brightness by 1 point.
Shift+2	Decrease magenta brightness by 1/2 point.
3	Decrease yellow brightness by 1 point.
Shift+3	Decrease yellow brightness by 1/2 point.
4	Increase cyan brightness by 1 point.
Shift+4	Increase cyan brightness by 1/2 point.
5	Increase magenta brightness by 1 point.
Shift+5	Increase magenta brightness by 1/2 point.
6	Increase yellow brightness by 1 point.

Press:	To:
Shift+6	Increase yellow brightness by 1/2 point.
7	Decrease red brightness by 1 point.
Shift+7	Decrease red brightness by 1/2 point.
8	Decrease green brightness by 1 point.
Shift+8	Decrease green brightness by 1/2 point.
9	Decrease blue brightness by 1 point.
Shift+9	Decrease blue brightness by 1/2 point.
0	Copy the same type setting from the previous shot.
Enter	Decrease master brightness by 1 point.
Shift+Enter	Decrease master brightness by 1/2 point.
+ (add)	Increase master brightness by 1 point.
Shift+'+' (add)	Increase master brightness by 1/2 point.
- (subtract)	Reset brightness.
/ (divide)	Increase green brightness by 1 point.
Shift+/ (divide)	Increase green brightness by 1/2 point.
* (multiply)	Increase blue brightness by 1 point.
Shift+* (multiply)	Increase blue brightness by 1/2 point.
NumLock	Increase red brightness by 1 point.
Shift+NumLock	Increase red brightness by 1/2 point.

Curves Menu — Hue, Lightness, Saturation and Luminance

hot keys:curves colour grading with the numeric keypadcurves colour grading:hot keysRefer to the following table for numeric keypad shortcuts functions when working on the Hue, Lightness, Saturation or Luminance values in the Curves menu.

Press:	To:
1	Decrease the cyan point's hue, lightness, saturation, or luminance value.
2	Decrease the magenta point's hue, lightness, saturation, or luminance value.
3	Decrease the yellow point's hue, lightness, saturation, or luminance value.
4	Increase the cyan point's hue, lightness, saturation, or luminance value.
5	Increase the magenta point's hue, lightness, saturation, or luminance value.
6	Increase the yellow point's hue, lightness, saturation, or luminance value.
7	Decrease the red point's hue, lightness, saturation, or luminance value.
8	Decrease the green point's hue, lightness, saturation, or luminance value.
9	Decrease the blue point's hue, lightness, saturation, or luminance value.
Enter	Decrease all points' hue, lightness, saturation, or luminance value.
+ (add)	Increase all points' hue, lightness, saturation, or luminance value.
/ (divide)	Increase the green points' hue, lightness, saturation, or luminance value.
* (multiply)	Increase the blue points' hue, lightness, saturation, or luminance value.
- (subtract)	Reset the current curve.
NumLock	Increase the red point's hue, lightness, saturation, or luminance value.

Editing Menu Edit

hot keys:editing with the numeric keypadediting:hot keysRefer to the following table for numeric keypad shortcuts functions when working in the Edit menu.

Press:	To:
1	Enter 1 in the timecode field.

Press:	To:
2	Enter 2 in the timecode field.
3	Enter 3 in the timecode field.
4	Enter 4 in the timecode field.
5	Enter 5 in the timecode field.
6	Enter 6 in the timecode field.
7	Enter 7 in the timecode field.
8	Enter 8 in the timecode field.
9	Enter 9 in the timecode field.
0	Enter 0 in the timecode field.
. (decimal)	Enter 00 in the timecode field.
+ (add)	Set the edit operation to "plus."
/ (divide)	Reset the current timecode.
* (multiply)	Switch between the trim in, trim out, slide and default editing modes.
- (subtract)	Set the edit operation to "minus."

Editing Menus—Capture and Playout

hot keys:capturing and playing out with the numeric keypad
 playing out:hot keys
 capturing:hot keys
 Refer to the following table for numeric keypad shortcuts functions when working in the Capture and Playout menus.

Press:	To:
1	Enter 1 in the timecode field.
2	Enter 2 in the timecode field.
3	Enter 3 in the timecode field.
4	Enter 4 in the timecode field.

Press:	To:
5	Enter 5 in the timecode field.
6	Enter 6 in the timecode field.
7	Enter 7 in the timecode field.
8	Enter 8 in the timecode field.
9	Enter 9 in the timecode field.
0	Enter 0 in the timecode field.
. (decimal)	Enter 00 in the timecode field.
/ (divide)	Reset the current timecode.
* (multiply)	Switch the timecode typing focus to the in timecode.
– (subtract)	Switch the timecode typing focus to the out timecode.

Stereoscopy

Use these keyboard shortcuts when the Stereoscopy feature is enabled.

Press:	To:
Alt+L	Assigns the layer the focus point is positioned on as the Left Eye.
Alt+R	Assigns the layer the focus point is positioned on as the Right Eye.
; (semicolon)	Toggles the Player to display the Left Eye or Right Eye footage.
Ctrl+F4	Cycle through the Stereo Dual View modes (i.e., 2-up, Blend, Horizontal Wipe, and Vertical Wipe).
Shift+Alt+F4	Return to the previous Stereo Dual View mode.

Animation

hot keys:creating animationsanimations:hot keysUse these keyboard shortcuts in the Animation menu.

Press:	To:
Alt+A	Enable/disable Autokey.

Press:	To:
Delete	Delete the selected keyframe.
Drag	Draw a selection box.
Right-drag	Zoom in or out.
Middle-drag	Pan the view.
Backspace	Delete last tracked position.
Ctrl (left)+C	Copy keyframe(s).
Ctrl (left)+V	Paste keyframe(s).
Alt+C	Toggle between 'One Fr' and All Fr' copy modes.
M	Return to Move mode in the Animation Editor.

Colour Management

Press:	To:
Shift+M	Mute/Unmute Colour Transform in Custom Mode Editor.

Control Panel

Press:	To:
Pause (Button to the right of the Function keys)	Reparsing ACS Control Panel user file.
Shift+F	Change Font On ACS.

CDL

Press:	To:
Shift+E	Enable/Disable CDL

Miscellaneous Functions

hot keys:miscellaneous functionsThese keyboard shortcuts are for assorted tasks (e.g., text editing, toggling render settings, and manipulating geometries).

Press:	To:
Right-click	Scroll through the option box options in reverse order. For example, refer to the Filter option box within Image > Transcode > Format settings.
Shift+Insert	Exit Lustre without confirmation.
Shift+Esc	Cancel Burn buffer preallocation.
Shift+F1	Access Lustre help system.
Shift-drag	Quickly increase/decrease the value of colour wheels and certain sliders. Use this hotkey to allow you to surpass the minimum/maximum value restricted by using the user interface.
Alt-drag	Slowly increase/decrease the value of colour wheels and certain sliders. Use this hotkey to allow you to surpass the minimum/maximum value restricted by using the user interface.
Tab	Move the focus to the next text field in the current menu if a text field has focus.
Ctrl+C	Copy selected text.
Ctrl+V	Paste copied text into the current text field.
Ctrl-click	Reset a parameter when you click the parameter's user interface element.
Shift+B	Bypass all menu parameters.
R	Resets the current menu.
Ctrl+R	Refresh the displayed list to show any changes you have made. You can press Ctrl+R to refresh the Cutlist, EDL list, Audio list, overlay list, LUT list and Presets list.
Ctrl+Backspace (Presets menu)	Delete the active preset.
Ctrl+Backspace (Gang tool)	Delete the active gang.
M	Start result caching.
N	Switch off the result cache.
[(left bracket)	Switch off the render flag of the current shot.

Press:	To:
] (right bracket)	Switch on the render flag of the current shot.
{ (left brace)	Switch off the render flag of all the shots.
} (right brace)	Switch on the render flag of all the shots.
X	Switch on/off background rendering.
Shift+W	Switch on/off Incinerator.
Ctrl+Z	Undo the last operation.
Ctrl+Alt+Z	Reverse the last 'Undo' operation.
Ctrl+Enter	Change Cursor Size (Invisible, 1 point, cross hair).

XML in Lustre

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editing:XML-based filesXML:viewing and editing files Lustre's XML-based files are stored as plain text on disk so that you may view, generate, and, in certain cases, modify them. The three types of XML-based files are:

- CUT (*.cut.xml)
- CLIP (*.clip.xml)
- GRADENOTES (*.desc.xml)

The XML files are generated by Lustre and should be modified sparingly and with caution, as errors can cause serious malfunctions. An example of a modification you could safely make would be to change the Note field in the DESC file. The Note field contains a shot's note text. See [Assigning Notes to Shots](#) (page 137).

Limitations

limitations, XML-based filesXML:limitations Lustre's XML-based files have the following limitations:

- Certain functions have not been implemented.
- You can only include hard returns in the structure tags. You must include all other tags and their contents (opening tag, value, and closing tag) in a single line.
- You can use XML features that are included in the predefined tag list only. This is to ensure optimized performance.
- The Lustre XML parser ignores tags that you use to store additional information.

CUT File Tags

CUT files:modifyingXML:modifying CUT filesThe CUT file is located in the Library directory and contains the following shot information:

- Physical location of files, trims, and additional metadata information (such as EDL and keycode data).
- Clip information (such as timecode and keycode data).
- Timeline information (such as frame rate and video tracks).
- Transcode information, if relevant.
- Retime effect parameters.
- Dissolve parameters.

The CUT file is built from the sequence of shots, and its order determines the order of shots on the Lustre Timeline.

When modifying the CUT file, you are restricted to the following tags.

NOTE Items in the Children row are occasionally marked with a + (plus sign) or * (asterisk). The + indicates that the parent tag can contain more than one instance of this element. The * indicates that the element is mandatory.

Cut	
Description	The root tag that contains opening and closing tags. It is a structure tag and as such can include hard returns.
Parameters	For the current release the only parameter allowed is Ver="3.0"
Parents	N/A
Children	+*Shot
Shot	
Description	A single shot (uninterrupted sequence of images). It is a structure tag and as such can include hard returns. The parent cut tag can contain any number of shots.
Parameters	N/A
Parents	Cut
Children	+Seq, +AliasName, +EData
Seq	
Description	The image sequence location. For example: [HOME]/scene1/1828x1332/%05d.dpx*7751.
Parameters	N/A
Parents	Shot
Children	N/A
AliasName	
Description	The shot's short name. An asterisk (*) indicates a previous wedge number. You can make the alias name appear in the Library and the browser by pressing W on the keyboard.
Parameters	N/A

AliasName	
Parents	Shot
Children	N/A
EData	
Description	The structure for storing editing metadata.
Parameters	N/A
Parents	Shot
Children	+Uniqueld, +SrcFullStart, +SrcFullLength, +SrcTrimStart, +SrcTrimLength, +ResStart, +ResLength, FadeType, FadeStartFromEnd, FadeSize, FadeCurve, RetimeRefFrame, RetimeSpeed, RetimeRemain, EDLEvent, EDLFadeDur, EDLFrameRate, EDLReelName, EDLFadeType, EDLSrcTcIn, EDLSrcTcOut, EDLRecTcIn, EDLRecTcOut, EDLFadeDur, EDLRetimeSpeed, EDLRetimeRef, EDLFadeUID, EDLKeyCodeStart, EDLKeyCodeEnd, DLEDLRes, DLEDLStartTc, DLEDLFrameIdList, DLEDLClipName, MediaUnlinked, MediaPtr, MediaDef, MediaLinkData, DPXTimeCodeStart, DPXTimeCodeEnd, DPXKeyCodeStart, DPXKeyCodeEnd, DPXFrameRate, DPXCodeRes, DPXKeyCodeType
Uniqueld	
Description	A shot's unique identification string. If generated internally, do not modify. This would result in grade loss since shots and grades are linked by the unique ID. If the CUT file was generated externally, the ID must respect the following conditions: it must be unique within the cutlist, and the data type must be a 64-bit integer in a hexadecimal format. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData
Children	N/A
SrcFullStart	
Description	The first frame of the original image sequence. The frame number is converted and displayed as timecode.
Parameters	N/A
Parents	EData

SrcFullStart	
Children	N/A
SrcFullLength	
Description	The shot's number of frames.
Parameters	N/A
Parents	EData
Children	N/A
SrcTrimStart	
Description	The trim start frame. This value should be greater than the SrcFullStart value and smaller than the sum of SrcFullStart plus SrcFullLength.
Parameters	N/A
Parents	EData
Children	N/A
SrcTrimLength	
Description	The trimmed shot length. The sum of SrcTrimStart plus SrcTrimLength should always be smaller than the sum of SrcFullStart plus SrcFullLength.
Parameters	N/A
Parents	EData
Children	N/A
ResStart	
Description	The start record frame. The frame number can be converted to timecode if required.
Parameters	N/A
Parents	EData

ResStart	
Children	N/A
ResLength	
Description	The record length in frames.
Parameters	N/A
Parents	EData
Children	N/A
FadeType	
Description	The transition type. Type 1 is a dissolve, and type 0 is a cut.
Parameters	N/A
Parents	EData
Children	N/A
FadeStartFromEnd	
Description	The starting frame of the transition, counting from the end of the current shot.
Parameters	N/A
Parents	EData
Children	N/A
FadeSize	
Description	Length of the transition in frames.
Parameters	N/A
Parents	EData

FadeSize	
Children	N/A
FadeCurve	
Description	Container for transition curves. There are two types of transition curves: InChannel and OutChannel. The InChannel transition curve determines the transparency of the current shot, whereas the OutChannel transition curve determines the transparency of the overlapped shot.
Parameters	N/A
Parents	EData
Children	+InChannel, +OutChannel
InChannel	
Description	The transition curve that determines the transparency of the current shot.
Parameters	N/A
Parents	EData
Children	+*Point
OutChannel	
Description	The transition curve that determines the transparency of the overlapped shot.
Parameters	N/A
Parents	EData
Children	+*Point
Point	
Description	One control point on a curve. For dissolves, the curve calculation is based on Hermite interpolation, and all values are normalized to a 0-65535 range.
Parameters	N/A
Parents	InChannel, OutChannel

Point	
Children	+X, +Y, +TangentX, +TangentY
X	
Description	X coordinate of a control point.
Parameters	N/A
Parents	Point
Children	N/A
Y	
Description	Y coordinate of a control point.
Parameters	N/A
Parents	Point
Children	N/A
Tangent X	
Description	The absolute X position of the tangent point. This is unrelated to the tangent angle.
Parameters	N/A
Parents	Point
Children	N/A
Tangent Y	
Description	The absolute Y position of the tangent point. This is unrelated to the tangent angle.
Parameters	N/A
Parents	Point

Tangent Y	
Children	N/A
RetimeRefFrame	
Description	The retime's base point in frames. This is usually equivalent to the SrcTrimStart.
Parameters	N/A
Parents	EData
Children	N/A
RetimeSpeed	
Description	Speed change rate. Supported data type is long float ("lf", aka double). For example, normal speed is 1.0, half speed is 0.5, double speed is 2.0, -1.0 is normal speed reverse play, -0.5 is half speed reverse play, and -2.0 is double speed reverse play.
Parameters	Type
Parents	EData
Children	N/A
RetimeRemain	
Description	Value for compensating rounding errors. This tag is used only if a retimed shot was retrimmed. Otherwise its value is zero. Supported data type is long float ("lf", aka double).
Parameters	Type
Parents	EData
Children	N/A
EDLEvent	
Description	EDL event number.
Parameters	N/A
Parents	EData

EDLEvent	
Children	N/A
EDLFadeDur	
Description	EDL fade duration in frames.
Parameters	N/A
Parents	EData
Children	N/A
EDLFrameRate	
Description	EDL frame rate. This tag's parameter is the float data type. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData
Children	N/A
EDLReelName	
Description	EDL reel name. The tag's parameter is the string data type. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData
Children	N/A
EDLFadeType	
Description	The EDL fade type. Legal values include: -1= cut -2=dissolve >=SMPTE wipe type number
Parameters	N/A
Parents	EData

EDLFadeType	
Children	N/A
EDLSrcTcln	
Description	EDL source in timecode. This tag's parameter is the timecode data type. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData
Children	N/A
EDLSrcTcOut	
Description	EDL source out timecode. This tag's parameter is the timecode data type. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData
Children	N/A
EDLRecTcln	
Description	EDL record in timecode. This tag's parameter is the timecode data type. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData
Children	N/A
EDLRecTcOut	
Description	EDL record out timecode. This tag's parameter is the timecode data type. See CUT File Data Types (page 763).
Parameters	Type
Parents	EData

EDLRecTcOut	
Children	N/A
EDLFadeDur	
Description	EDL fade duration in frames.
Parameters	N/A
Parents	EData
Children	N/A
EDLRetimeSpeed	
Description	EDL retime as a percentage value.
Parameters	N/A
Parents	EData
Children	N/A
EDLRetimeRef	
Description	The retime's base point in frames. This is usually equivalent to the SrcTrimStart.
Parameters	N/A
Parents	EData
Children	N/A
EDLFadeUID	
Description	Unique ID of the second shot in the dissolve.
Parameters	N/A
Parents	EData

EDLFadeUID	
Children	N/A
EDLKeyCodeStart	
Description	EDL keycode start. This tag's parameter is the keycode data type. See CUT File Data Types (page 763).
Parameters	N/A
Parents	EData
Children	N/A
EDLKeyCodeEnd	
Description	EDL keycode end. This tag's parameter is the keycode data type. See CUT File Data Types (page 763).
Parameters	N/A
Parents	EData
Children	N/A
DLEDLRes	
Description	String from the DLEDL that describes the image format.
Parameters	N/A
Parents	EData
Children	N/A
DLEDLStartTc	
Description	Start timecode from the DLEDL.
Parameters	N/A
Parents	EData

DLEDLStartTc	
Children	N/A
DLEDLFrameIdList	
Description	Pointer to the frame ID list, which is used by the system to locate frames on the Stone filesystem. Supported data type is integer. See CUT File Data Types (page 763).
Parameters	N/A
Parents	EData
Children	N/A
DLEDLClipName	
Description	DLEDL clip name.
Parameters	N/A
Parents	EData
Children	N/A
DPXTimeCodeStart	
Description	DPX header timecode start.
Parameters	N/A
Parents	EData
Children	N/A
DPXTimeCodeEnd	
Description	DPX header timecode end.
Parameters	N/A
Parents	EData

DPXTimeCodeEnd	
Children	N/A
DPXKeyCodeStart	
Description	DPX header keycode start.
Parameters	N/A
Parents	EData
Children	N/A
DPXKeyCodeEnd	
Description	DPX header keycode end.
Parameters	N/A
Parents	EData
Children	N/A
DPXFrameRate	
Description	DPX header frame rate.
Parameters	N/A
Parents	EData
Children	N/A
DPXCodeRes	
Description	The resolution of the DPX header origin (full or half).
Parameters	N/A
Parents	EData

DPXCodeRes	
Children	N/A
DPXKeyCodeType	
Description	The number of frames stored on one foot of film.
Parameters	N/A
Parents	EData
Children	N/A

CUT File Data Types

CUT files:data typesXML:CUT file data typesThe following data types are supported in CUT file tags.

Data Type	Description
f	Floating point number. These can be always expressed as a fraction of two integers. For example: -147.244
s	Sequence of ASCII characters. These can include both letters and numbers. For example: abcdef_12345-ABCDEF
tc	Encoded timing format. Format: “hh:mm:ss:ff” where hh=hours, mm=minutes, ss=seconds, and ff=frames. For example: 01:23:45:23
kk	Film-based timing format. Format: “TT PPPP FFFF+OO” where TT=film type, PPPP=prefix, FFFF=feet frames, and OO=offset. For example: KI 120863 7624+07
u	Unsigned integer. These are the positive numbers, and are usually stored in 32-bit. For example: 1
i64	64-bit integer. These can be positive or negative numbers, and are usually stored in 64-bit. For example: -7846238974878347

If you want to use an integer, do not specify a data type.

CUT File Example

CUT files:exampleXML:CUT file exampleThe following is an example of an XML-based CUT file.

```

<Timeline Ver="1.0">
  <TimelineName Type="s">PAL_sample_cut</TimelineName>
  <StereoEnabled>0</StereoEnabled>
  <TimelineFrameRate Type="f">25</TimelineFrameRate>
  <TimelineDropMode Type="s">0</TimelineDropMode>
  <TimelineFullRes>
    <Width>720</Width>
    <Height>576</Height>
    <BitsPerPixel>32</BitsPerPixel>
    <NumChannels>3</NumChannels>
    <IsFloat Type="s">false</IsFloat>
    <FrameBufferSize>1658880</FrameBufferSize>
    <FrameByteOrder Type="s">LE</FrameByteOrder>
    <AspectRatio Type="f">1.33333</AspectRatio>
    <ScanFormat Type="s">P</ScanFormat>
    <FrameRate Type="f">25</FrameRate>
    <DropFrameMode Type="s">0</DropFrameMode>
  </TimelineFullRes>
  <videotrack idx="0" trackType="Primary">
    <videolayer idx="0">
      <OutEye>Mono</OutEye>
      <Shot>
        <FullRes>
          <Width>720</Width>
          <Height>576</Height>
          <BitsPerPixel>32</BitsPerPixel>
          <NumChannels>3</NumChannels>
          <IsFloat Type="s">false</IsFloat>
          <FrameBufferSize>1658880</FrameBufferSize>
          <FrameByteOrder Type="s">BE</FrameByteOrder>
          <AspectRatio Type="f">1.33333</AspectRatio>
          <ScanFormat Type="s">P</ScanFormat>
          <FrameRate Type="f">23.976</FrameRate>
          <DropFrameMode Type="s">0</DropFrameMode>
        </FullRes>
        <Seq>
          <ClipName>3d_track_NIGHT_4E84A13F000047</ClipName>
          <File>&lt;HOME&gt;/PAL/DPX/3d_track_NIGHT/720x576/3d_track_night_shot_grd01.X04d.dpx</File>
        </Seq>
        <EData>
          <UniqueId Type="i64">4E84A13F000047</UniqueId>
          <ShotType>Source</ShotType>
          <LibraryId Type="i64">4E4C202C0000228</LibraryId>
          <SrcFullStart>141</SrcFullStart>
          <SrcFullLength>78</SrcFullLength>
          <SrcTrimStart>161</SrcTrimStart>
          <SrcTelecineOffset>0</SrcTelecineOffset>
          <SrcTrimLength>44</SrcTrimLength>
          <ResStart>0</ResStart>
          <ResLength>44</ResLength>
          <Track>0</Track>
          <Layer>0</Layer>
          <FolderReelName Type="s">3d_track_NIGHT</FolderReelName>
          <DPXDropFrameMode>0</DPXDropFrameMode>
          <DPXFrameRate Type="f">23.976025</DPXFrameRate>
          <DLEDLPixelRatio Type="f">1.066664</DLEDLPixelRatio>
          <DPXTimeCodeStart Type="tc">00:00:05:21</DPXTimeCodeStart>
          <DPXTimeCodeEnd Type="tc">00:00:09:02</DPXTimeCodeEnd>
          <DPXCodeRes>0</DPXCodeRes>
          <ThumbnailPath Type="s">/mnt/StorageMedia/projects/Bernice_2012x1/Thumbnails/4E84A13F0000470.rgb</ThumbnailPath>
          <TL_DRAGED_TC>0</TL_DRAGED_TC>
          <TL_ALIAS_ID Type="s">3d_track_NIGHT</TL_ALIAS_ID>
          <TL_TRIM_RES_START_ID>0</TL_TRIM_RES_START_ID>
          <TL_TRIM_RES_LEN_BAK_ID>52</TL_TRIM_RES_LEN_BAK_ID>
          <TL_TRIM_SRC_START_ID>163</TL_TRIM_SRC_START_ID>
          <TL_TRIM_SRC_LEN_BAK_ID>52</TL_TRIM_SRC_LEN_BAK_ID>
          <EDLReelNameLong Type="s">3d_track_NIGHT</EDLReelNameLong>
          <DLEDLStartTc Type="tc">00:00:05:21</DLEDLStartTc>
          <DLEDLStartTcProxy Type="tc">00:00:05:21</DLEDLStartTcProxy>
          <MediaUnlinked>7</MediaUnlinked>
          <DLEDLPath Type="s">&lt;HOME&gt;/PAL/DPX/3d_track_NIGHT/720x576/</DLEDLPath>
          <DLEDLFileName Type="s">3d_track_night_shot_grd01.X04d.dpx</DLEDLFileName>
          <DLEDLRes Type="s">720:576:32:1:1.06666:1658880:BE:P:23.976:0</DLEDLRes>
          <ClipFrameRate Type="f">23.976000</ClipFrameRate>
          <ClipDropMode>0</ClipDropMode>
          <TL_TMP_INT_ID>0</TL_TMP_INT_ID>
          <ReelName Type="s">3d_track_NIGHT</ReelName>
          <TL_SHOT_SELECTED>0</TL_SHOT_SELECTED>
          <TL_DISOLVE_SELECTED>0</TL_DISOLVE_SELECTED>
        </EData>
        <ImgInfo Res="Full">
          <Align>512</Align>
          <MinIOSz>512</MinIOSz>
          <MaxIOSz>2147483648</MaxIOSz>
          <HeadSize>8192</HeadSize>
          <Width>720</Width>
          <Height>576</Height>
          <DBFFlag>111</DBFFlag>
          <FileType>0</FileType>
          <ImageType>4</ImageType>
          <WtSoft>0</WtSoft>
        </ImgInfo>
        <ImgInfo Res="Half">

```

Tangent Element Control Surface (Lustre)

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The Tangent Element control surface is designed to improve interactivity when colour grading film and video footage. You can accomplish all of the main grading tasks you do in the Lustre user interface using the Tangent Element control surface.

The Modes

The basic Tangent Element workflow is mode based. This means that you set the appropriate mode for the grading tasks you wish to accomplish and the knob, button and trackball functions are dynamically updated. Each mode consists of multiple pages of parameters that can be cycled through.

To select a mode, press the appropriate button on the MF module, as indicated on the module's screen.

The following modes are supported by the Tangent Element Control Surface:

Grading Mode (Linear and Logarithmic)

The available functions in this mode correspond to those in the Colour/Grading menu in the application. By default, the control surface is in Grade Mode (Linear or Logarithmic, according to your project settings).

Curves Mode

The available functions in this mode correspond to those in the Colour/Grading menu in the application.

Geometry Mode

The available functions in this mode correspond to those in the Colour/Secondaries menu in the application.

Pan & Scan Mode

The available functions in this mode correspond to those in the Image/Reposition menu in the application.

HLS Keyer Mode

The available functions in this mode correspond to the HLS Keyer functions in the Colour/Secondaries menu in the application.

Diamond Keyer Mode

The available functions in this mode correspond to the Diamond Keyer functions in the Colour/Secondaries menu in the application.

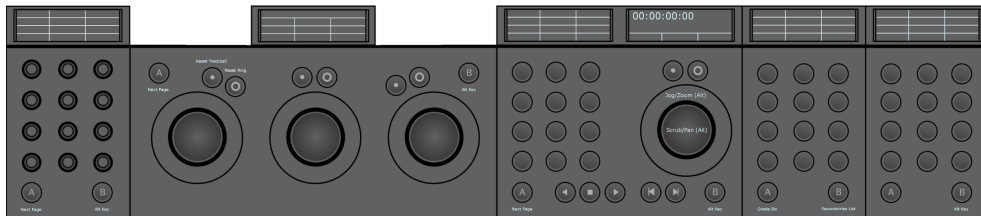
Editing Mode

The available functions in this mode correspond to those in the Editing/Timeline menu in the application.

Preferences Mode

The Preferences mode groups together various user set preferences.

Using the Modules



The Tangent Element Control Surface is composed of four modules.

The layout of the displays of each module mirrors the functions of the knobs/buttons of each module.

BEST PRACTICE It is recommended to add a second BT module to display and access commonly used functions at all times, otherwise only available the second and third pages of the MF module.

KB module (Knobs)

The KB module is a knob-based interface for user input parameters.

The values of each parameter assigned to the knobs can be reset by pressing the knob.

A button: Cycle through the different pages of functions mapped to the module.

B button: Enable either Precise Mode or Turbo Mode, based on your user settings.

TK module (Trackballs)

The TK module is also an interface for user input parameters. The trackballs and rings provide an intuitive way of precisely modifying parameters and are especially well suited for grading, among other things.

Moving the trackball from left to right / right to left has the same effect as moving them up and down / down and up.

Turning the ring from left to right increases the value of the assigned parameter, whereas turning the ring from right to left decreases the value.

The values of each parameter assigned to each trackball and ring can be reset by pressing the Reset button above them.

A button: Cycle through the different pages of functions mapped to the module.

B button: Enable either Precise Mode or Turbo Mode, according to your user settings, for all knobs, trackballs and rings.

MF module (Multi-Function)

The MF module enables you to select the mode you want to work in and provides a transport section, which allows navigation via the trackball and ring as well.

The values of each parameter assigned to each trackball and ring can be reset by pressing the Reset button above them.

A button: Cycle through the different pages of functions mapped to the module.

B button: Enable alternate functionality of the buttons, trackball and ring.

Trackball: The trackball's default behavior is scrub. By holding the B button, the behavior changes to pan.

Ring: The ring's default behavior is jog. By holding the B button, the behavior changes to zoom.

NOTE You can press the B button twice and lock Alt mode.

Button sequences for alternate functions on the MF module

- **Forward Play button + B Button:** Cycle forward through the grades applied to succeeding shots and temporarily apply them to the current shot. Pressing Enter permanently applies the selected grade to the current shot.
- **Backward Play button + B Button:** Cycle through the grades applied to previous shots and temporarily apply them to the current shot. Pressing Enter permanently applies the selected grade to the current shot.
- **Next Clip Button + B Button:** Move the positioner forward to the next keyframe in your timeline .
- **Previous Clip Button + B Button:** Move the positioner backward to the previous keyframe in your timeline.
- **Stop Button + Forward Play button:** Move the positioner forward by one frame in your timeline.
- **Stop Button + Backward Play button:** Move the positioner backward by one frame in your timeline.

BT (1) module (Buttons)

The BT module is dedicated to providing quick access to the secondaries and the Grade Bin. It is available in all modes, except Preferences Mode. The buttons mirror the position of the secondaries and of saved grades in the Grade Bin.

A button: allows you to enable/disable Grade Bin access.

B button: allows you to cycle through the four pages of secondaries, giving you access to all 48 secondaries.

BT (2) module (Buttons)

The second BT module is recommended. It enables you access at all times to View Modes and commonly used functions such as setting keyframes, copying and saving, among others.

A button: The A button on this module is not mapped. Pressing it will have no effect.

B button: Enable alternate functionality of the buttons, trackball and ring.

Installing the Control Surface

The first time you connect the Tangent Element Control Surface to your Lustre station, it automatically connects to your software and populates all the menus.

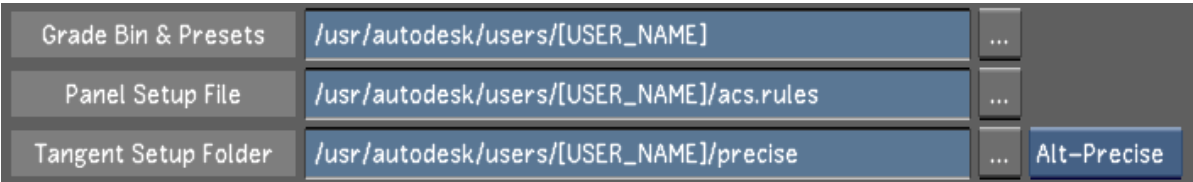
If the Control Surface does not automatically connect, see the [Troubleshooting](#) (page 806) section.

Once it is connected, you must access the User Preferences and select whether you want the behavior of the B button on the KB and TK panels to be Precise Mode, which increases and decreases the parameter values in smaller increments, giving you more precision. Or Turbo Mode, which increases and decreases the parameter values in larger increments, enabling you to set your values quickly.

TIP You can create a user for each mode and select one or the other based on whether you want to work with Precise Mode or Turbo Mode.

To set the behavior of the B button

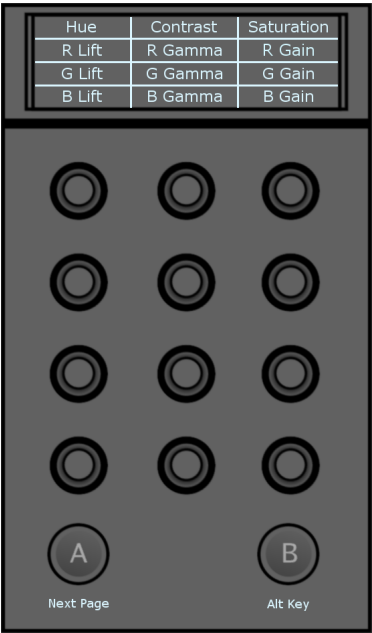
- 1 Access the Setup/Settings menu.
- 2 Press Edit, next to the User Settings.
- 3 Select the System & Menu tab.
- 4 Press the Alt-Precise/Alt-Turbo button to the right of the Tangent Setup Folder field to select either Precise or Turbo Mode.



Control Surface Layouts

Linear Grading Layout

Module 1 (KB) - Page 1 of 2

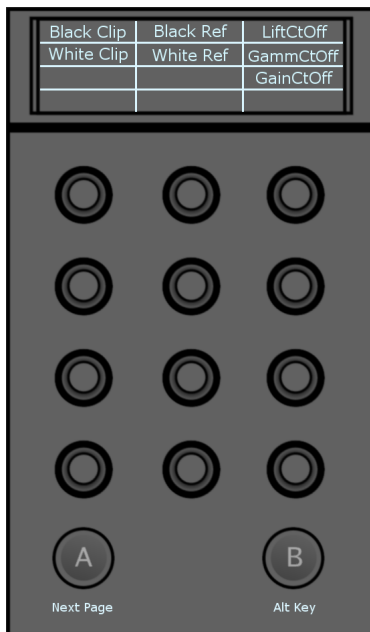


- **Hue:** Modify the hue value.

NOTE The hue can only be modified on secondaries.

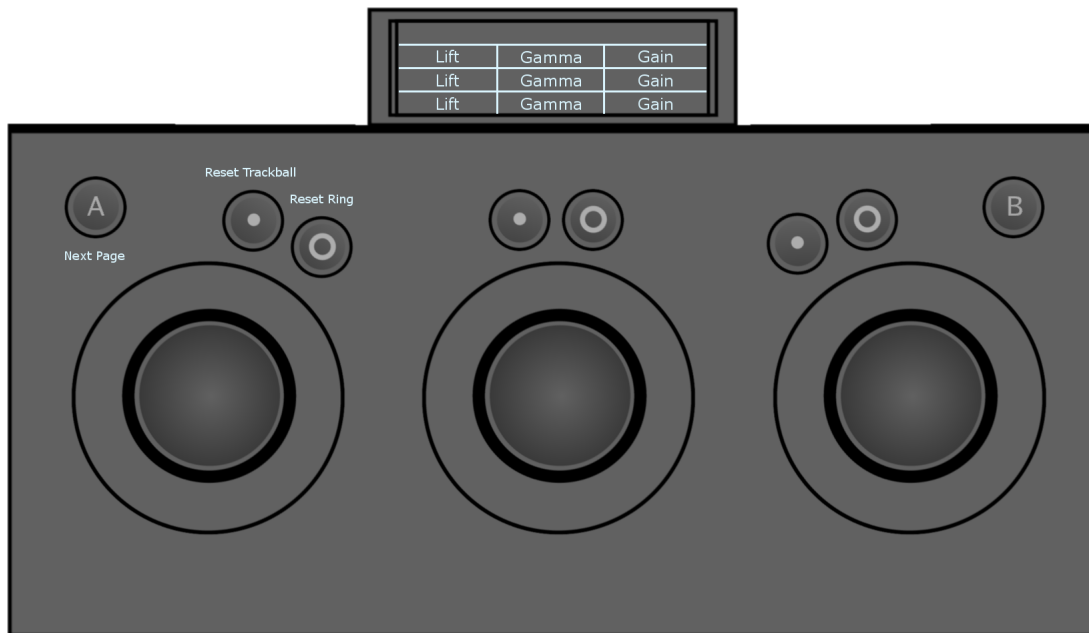
- **R Lift:** Modify the lift of the red channel.
- **G Lift:** Modify the lift of the green channel.
- **B Lift:** Modify the lift of the blue channel.
- **Contrast:** Modify contrast value.
- **R Gamma:** Modify the gamma of the red channel.
- **G Gamma:** Modify the gamma of the green channel.
- **B Gamma:** Modify the gamma of the blue channel.
- **Saturation:** Modify the saturation value.
- **R Gain:** Modify the gain of the red channel.
- **G Gain:** Modify the gain of the green channel.
- **B Gain:** Modify the gain of the blue channel.

Module 1 (KB) - Page 2 of 2

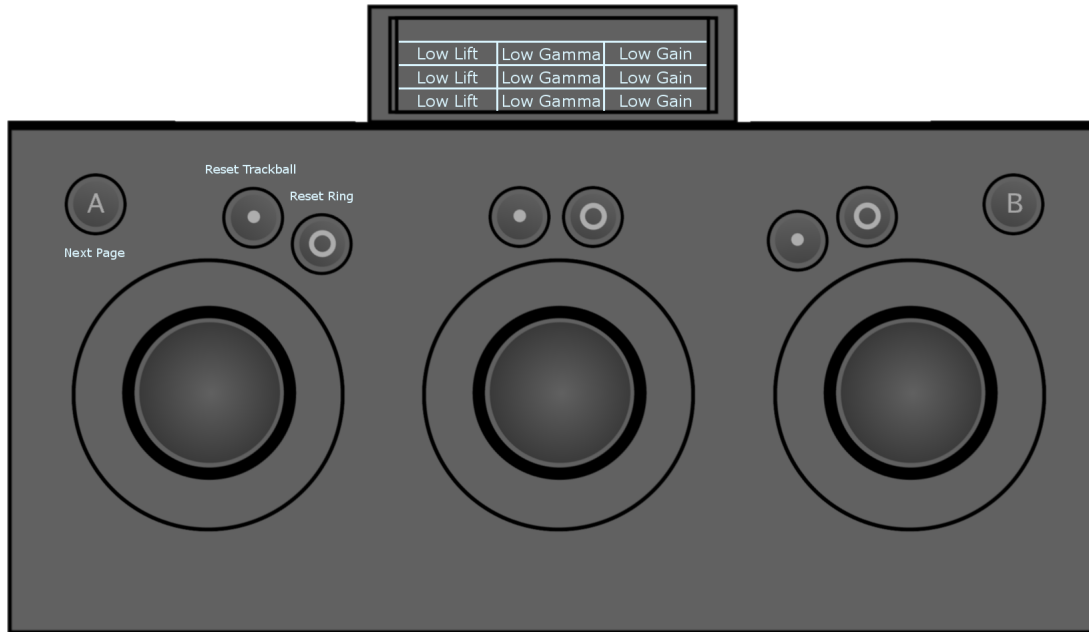


- **Black Clip:** Modify the black clip value.
- **White Clip:** Modify the white clip value.
- **Black Ref:** Modify the black reference value.
- **White Ref:** Modify the white reference value.
- **LiftCtOff:** Modify the lift cutoff value.
- **GammaCtOff:** Modify the gamma cutoff value.
- **GainCtOff:** Modify the gain cutoff value.

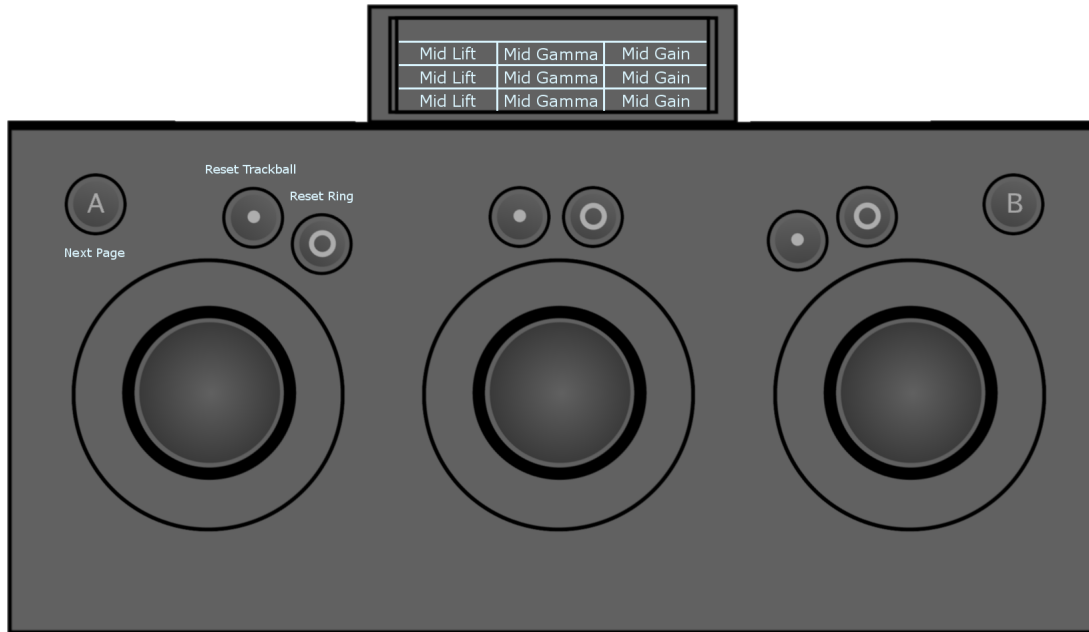
NOTE The Grade mode functions are always available, even when not in Grading mode. To access the Grading functions while in other modes, press the A button to cycle through the Grading pages. Pressing the A button twice brings you back to the first page of the current mode.



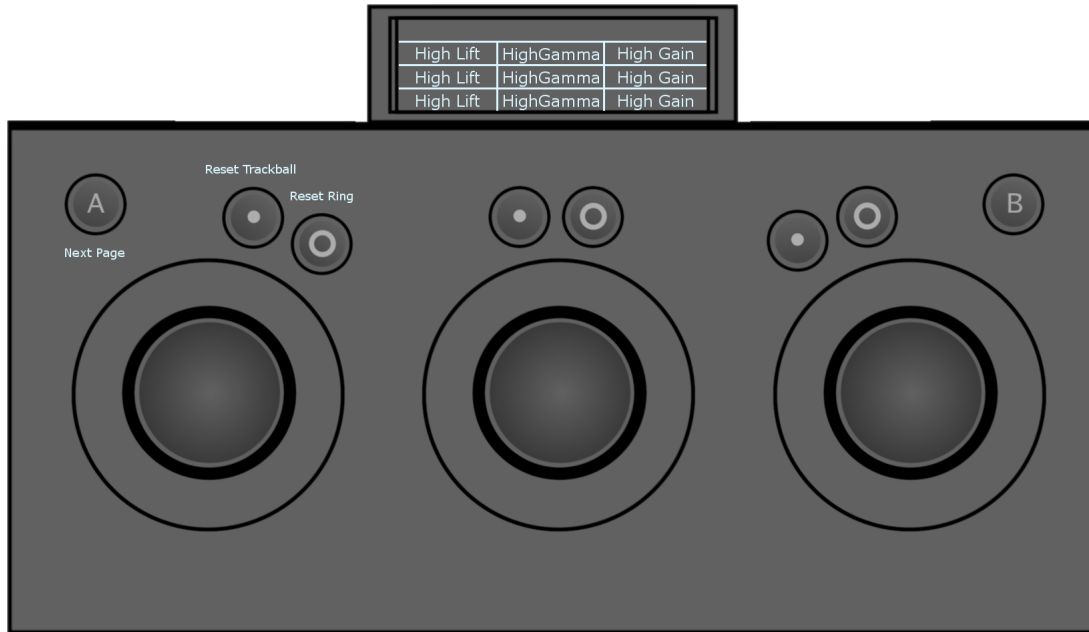
- **Lift:** Move the trackball right or left (x axis) to modify the lift in the low, mid and high range colour values (Master).
- **Lift:** Move the trackball up or down (y axis) to modify the lift in the low, mid and high range colour values (Master).
- **Lift:** Move the ring left or right to modify the lift of the luminance channel.
- **Gamma:** Move the trackball right or left (x axis) to modify the gamma in the low, mid and high range colour values (Master).
- **Gamma:** Move the trackball up or down (y axis) to modify the gamma in the low, mid and high range colour values (Master).
- **Gamma:** Move the ring left or right to modify the gamma of the luminance channel.
- **Gain:** Move the trackball right or left (x axis) to modify the gain in the low, mid and high range colour values (Master).
- **Gain:** Move the trackball up or down (y axis) to modify the gain in the low, mid and high range colour values (Master).
- **Gain:** Move the ring left or right to modify the gain of the luminance channel.



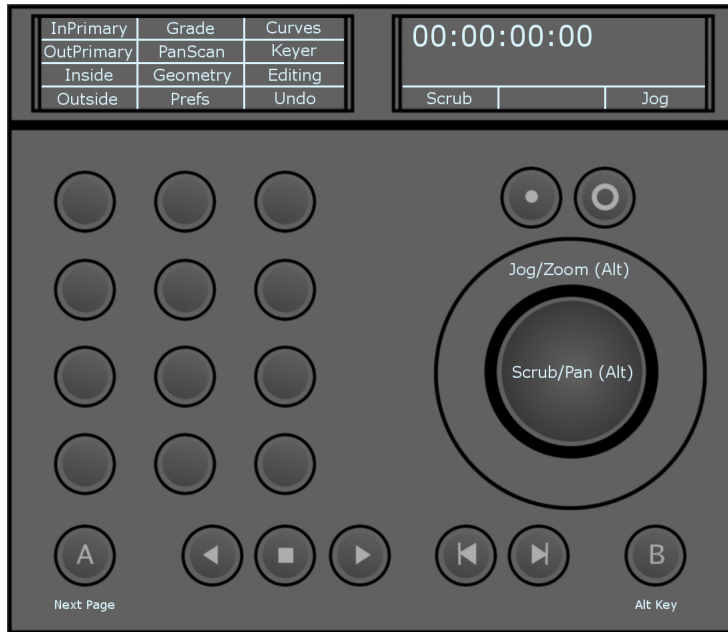
- **Low Lift:** Move the trackball right or left (x axis) to modify the lift in the low range colour values.
- **Low Lift:** Move the trackball up or down (y axis) to modify the lift in the low range colour values.
- **Low Lift:** Move the ring left or right to modify the lift of the luminance channel in the low range colour values.
- **Low Gamma:** Move the trackball right or left (x axis) to modify the gamma in the low range colour values.
- **Low Gamma:** Move the trackball up or down (y axis) to modify the gamma in the low range colour values.
- **Low Gamma:** Move the ring left or right to modify the gamma of the luminance channel in the low range colour values.
- **Low Gain:** Move the trackball right or left (x axis) to modify the gain in the low range colour values.
- **Low Gain:** Move the trackball up or down (y axis) to modify the gain in the low range colour values.
- **Low Gain:** Move the ring left or right to modify the gain of the luminance channel in the low range colour values.



- **Mid Lift:** Move the trackball right or left (x axis) to modify the lift in the mid range colour values.
- **Mid Lift:** Move the trackball up or down (y axis) to modify the lift in the mid range colour values.
- **Mid Lift:** Move the ring left or right to modify the lift of the luminance channel in the mid range colour values.
- **Mid Gamma:** Move the trackball right or left (x axis) to modify the gamma in the mid range colour values.
- **Mid Gamma:** Move the trackball up or down (y axis) to modify the gamma in the mid range colour values.
- **Mid Gamma:** Move the ring left or right to modify the gamma of the luminance channel in the mid range colour values.
- **Mid Gain:** Move the trackball right or left (x axis) to modify the gain in the mid range colour values.
- **Mid Gain:** Move the trackball up or down (y axis) to modify the gain in the mid range colour values.
- **Mid Gain:** Move the ring left or right to modify the gain of the luminance channel in the mid range colour values.



- **High Lift:** Move the trackball right or left (x axis) to modify the lift in the high range colour values.
- **High Lift:** Move the trackball up or down (y axis) to modify the lift in the high range colour values.
- **High Lift:** Move the ring left or right to modify the lift of the luminance channel in the high range colour values.
- **High Gamma:** Move the trackball right or left (x axis) to modify the gamma in the high range colour values.
- **High Gamma:** Move the trackball up or down (y axis) to modify the gamma in the high range colour values.
- **High Gamma:** Move the ring left or right to modify the gamma of the luminance channel in the high range colour values.
- **High Gain:** Move the trackball right or left (x axis) to modify the gain in the high range colour values.
- **High Gain:** Move the trackball up or down (y axis) to modify the gain in the high range colour values.
- **High Gain:** Move the ring left or right to modify the gain of the luminance channel in the high range colour values.



- **InPrimary:** Enable input primary grading mode.
- **OutPrimary:** Enable output primary grading mode.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.

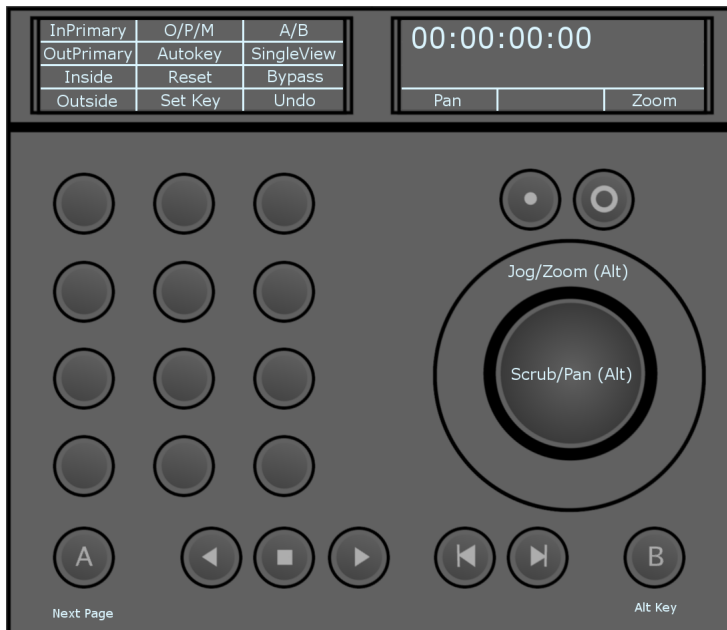
NOTE Inside grading is enabled by default.
- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Once enabled, single-press to select outside grading, to edit your grade.
- **Grade:** Access the Colour/Grade menu.
- **PanScan:** Access the Image/Reposition menu.
- **Geometry:** Enable the draw geometry mode in the Secondaries menu. The fourth row of functions on the module is dynamically updated to display the rectangle, circle and wipe options. Pressing the corresponding button enables you to add the desired geometry.
- **Prefs:** Access the preferences functions.
- **Curves:** Access the Colour/Curves menu.
- **Keyer:** Enable the keyer in the secondaries menu. The default behavior is to enable the HLS keyer. Pressing Keyer again enables the diamond keyer.
- **Editing:** Access the Editing/Timeline menu.
- **Undo:** Undo the last operation performed. Pressing the B button changes the function of the Undo button to Redo. The panel display is be updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).

InPrimary	Grade	Curves
OutPrimary	PanScan	Keyer
Inside	Geometry	Editing
Outside	Prefs	Redo

- **Confirm:** When the Lustre UI prompts you to confirm an operation, the Undo button is automatically updated to display Confirm. Press to confirm the operation.

InPrimary	Grade	Curves
OutPrimary	PanScan	Keyer
Inside	Geometry	Editing
Outside	Prefs	Confirm

Module 3 (MF) - Page 2 of 3



- **InPrimary:** Enable input primary grading mode.
- **OutPrimary:** Enable output primary grading mode.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.

NOTE Inside grading is enabled by default.

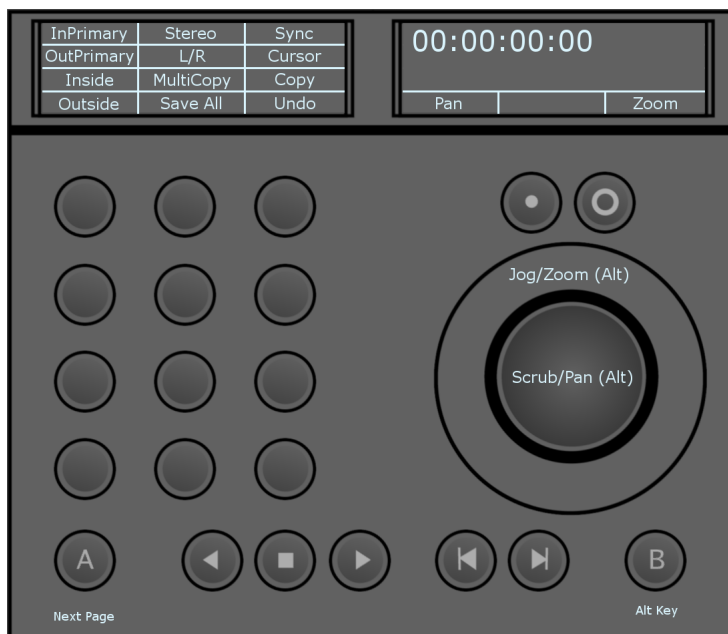
- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Once enabled, single-press to select outside grading, to edit your grade.
- **O/P/M:** Toggle between output, print and matte views.
- **Autokey:** Enable/disable Autokey.
- **Reset:** Press once to reset the currently selected grading tool. Press twice to reset all grading tools.
- **SetKey:** Set a keyframe at the current position on the currently selected channel. Pressing the B button changes the function of the SetKey button to SetKey All. The panel display is updated.

InPrimary	O/P/M	A/B
OutPrimary	Autokey	SingleView
Inside	Reset	Bypass
Outside	SetKeyAll	Undo

- **SetKeyAll:** Set a keyframe at the current position on all channels.
- **A/B:** Toggle A/B playheads.
- **SingleView:** Toggle between single, dual and multi views, as defined under the Preferences.
- **Bypass:** Press once to bypass the currently selected grading tool. Press twice to bypass all grading tools.
- **Undo:** Undo the last operation performed. Pressing the B button will change the function of the Undo button to Redo. The panel display is updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).

InPrimary	O/P/M	A/B
OutPrimary	Autokey	SingleView
Inside	Reset	Bypass
Outside	SetKey	Redo

Module 3 (MF) - Page 3 of 3



- **InPrimary:** Enable input primary grading mode.
- **OutPrimary:** Enable output primary grading mode.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.

NOTE Inside grading is enabled by default.

- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Once enabled, single-press to select outside grading, to edit your grade.
- **Stereo:** Enable stereoscopy.
- **L/R:** Toggle between tight eye view and left eye view modes (when working with stereoscopic footage).

- **MultiCopy:** Enter multi copy mode. When in multi copy mode, turn the ring to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button is automatically updated to display Apply. Press Apply to confirm and repeat the process for other shots as needed. To exit multi copy mode, press the MultiCopy button again.

InPrimary	Stereo	Sync
OutPrimary	L/R	Cursor
Inside	MultiCopy	Copy
Outside	Save All	Apply

- **SaveAll:** Save your current cut and grade.
- **Sync:** Sync your left and right eyes when working with stereoscopic footage. When in sync, any operation performed on the left eye is also applied to the right eye.
- **Cursor:** Enable cursor mode. When cursor mode is enabled, the trackball is used to move the cursor in the UI. In cursor mode, the Reset Trackball button acts as the left mouse button and the Reset Ring button acts as the right mouse button.
- **Copy:** Enter copy mode. When in copy mode, turn the ring to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button is automatically updated to display Apply. Press Apply to confirm the copy operation. Once the copy operation confirmed, you automatically exit copy mode.

InPrimary	Stereo	Sync
OutPrimary	L/R	Cursor
Inside	MultiCopy	Copy
Outside	Save All	Apply

- **Undo:** Undo the last operation performed. Pressing the B button will change the function of the Undo button to Redo. The panel display will be updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).

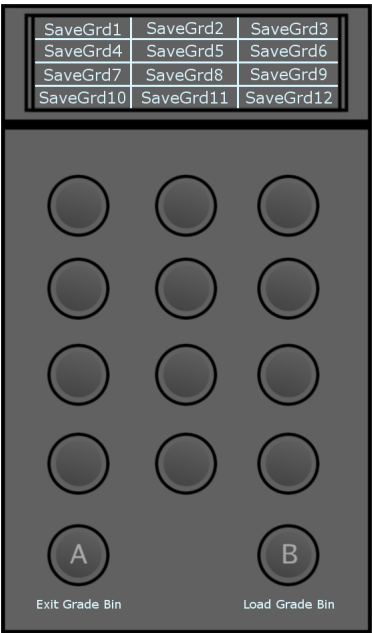
InPrimary	Stereo	Sync
OutPrimary	L/R	Cursor
Inside	MultiCopy	Copy
Outside	Save All	Undo

Module 4 (BT) - Page 1 of 6

Secondaries List (4 pages, 12 secondaries per page).

Module 4 (BT) - Page 6 of 6

Grade Bin - Save

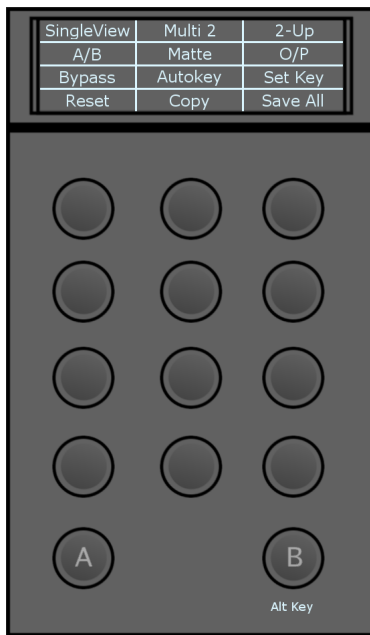


- **A Button:** Exit the Grade Bin.
- **B Button:** Toggle between load mode and save mode in the Grade Bin.

NOTE The trackball of the MF module navigates the Grade Bin when in Grade Bin mode.

Optional 2nd BT Module - Page 1 of 1

It is recommended to attach a second BT module, which is mapped to give you access to many of the most used functions at all times. These functions correspond to the second and third page of the MF module.



- **SingleView:** Toggle between single, dual and multi views, as defined under the Preferences.
- **A/B:** Toggle A/B playheads. Pressing Alt (B key) will change the function of the A/B button to L/R. The panel display is updated.



- **L/R:** Toggle between right eye view and left eye view modes (when working with stereoscopic footage).
- **Bypass:** Press once to bypass the currently selected grading tool. Press twice to bypass all grading tools.
- **Reset:** Press once to reset the currently selected grading tool. Press twice to reset all grading tools.
- **Multi 2:** Toggle the number of active viewports when in multi view. Options are:
 - 2
 - 4
 - 9
 - 16
- **Matte:** Enable/disable matte view.
- **Autokey:** Enable/disable Autokey.
- **Copy:** Enter copy mode. When in copy mode, turn the ring on the MF module to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button on the MF module is automatically updated to display Apply. Press Apply to confirm. Once the copy operation confirmed, you automatically exit copy mode. Pressing the B button changes the function of the Copy button to MultiCopy. The panel display is updated.

SingleView	Multi 2	2-Up
A/B	Matte	O/P
Bypass	Autokey	SetKey
Reset	MultiCopy	Save All

- **MultiCopy:** When in multi copy mode, turn the ring on the MF module to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button on the MF module is automatically updated to display Apply. Press Apply to confirm and repeat the process for other shots as needed. To exit multi copy mode, press the MultiCopy button again.

- **2-up:** Toggle the display mode when in dual view. Options are:

For A/B

- 2-up
- HorizWipe
- VertWipe

For L/R

- 2-up
- HorizWipe
- VertWipe
- Blend

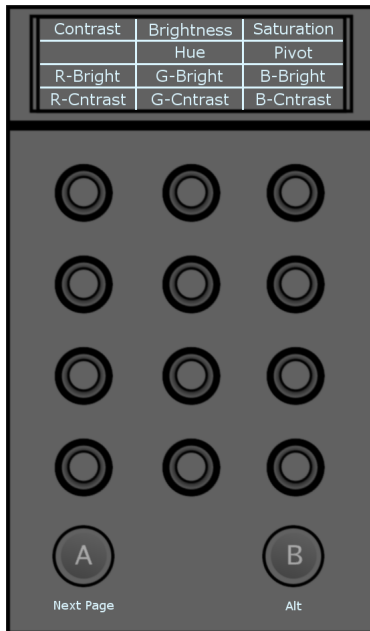
- **O/P:** Toggle between output and print views.
- **SetKey:** Set a keyframe at the current position on the currently selected channel. Pressing the B button will change the function of the SetKey button to SetKeyAll. The panel display is updated.

SingleView	Multi 2	2-Up
A/B	Matte	O/P
Bypass	Autokey	SetKeyAll
Reset	Copy	Save All

- **SetKeyAll:** Set a keyframe at the current position on all channels.
- **Save All:** Save your current cut and grade.

Logarithmic Grading Layout

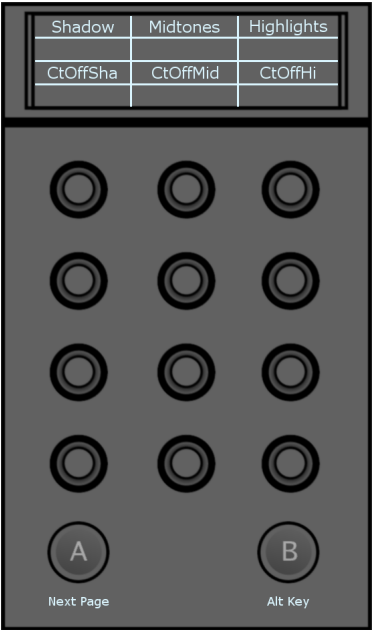
Module 1 (KB) - Page 1 of 2



- **Contrast:** Modify the global contrast value.
- **R Bright:** Modify the brightness of the red channel.
- **R Cntrast:** Modify the contrast of the red channel.
- **Brightness:** Modify the global brightness value.
- **Hue:** Modify global hue value.

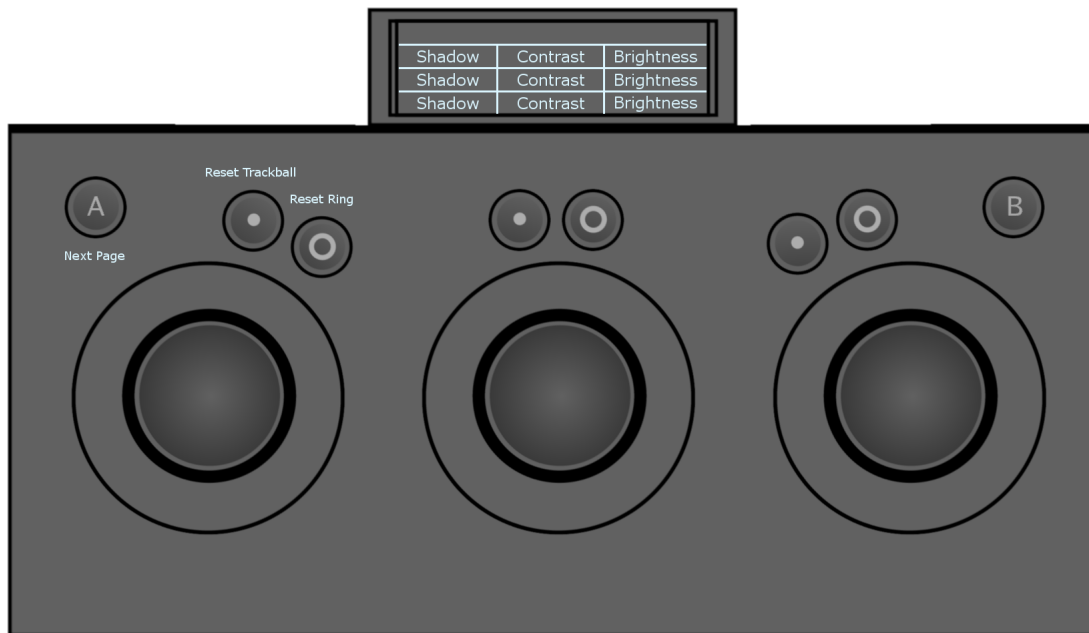
NOTE The hue can only be modified on secondaries.

- **G Bright:** Modify the brightness of the green channel.
- **G Cntrast:** Modify the contrast of the green channel.
- **Saturation:** Modify the global saturation value.
- **Pivot:** Modify the pivot value.
- **B Bright:** Modify the brightness of the blue channel.
- **B Cntrast:** Modify the contrast of the blue channel.

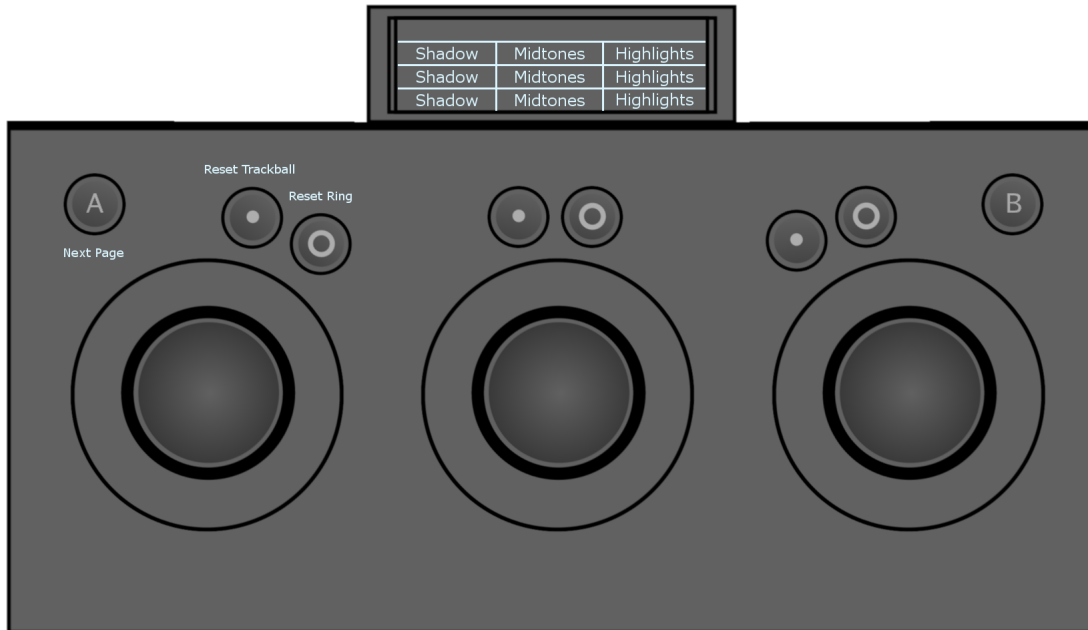


- **Shadow:** Modify the luminance of the low range colour values.
- **CtOffSha:** Set the cutoff value for the shadows.
- **Midtones:** Modify the luminance of the mid range colour values.
- **CtOffMid:** Set the cutoff value for the midtones.
- **Highlights:** Modify the luminance of the high range colour values.
- **CtOffHi:** Set the cutoff value for the highlights.

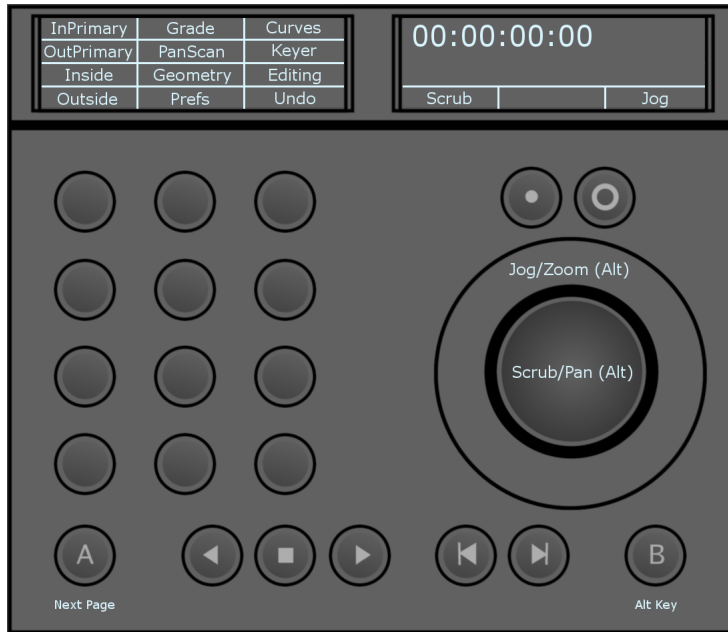
NOTE The Grade mode functions are always available, even when not in Grade mode. To access the grading functions while in other modes, press the A button to cycle through the grading pages. Pressing the A button twice brings you back to the first page of the current mode.



- **Shadow:** Move the trackball right or left (x axis) to add colour to the low range colour values.
- **Shadow:** Move the trackball up or down (y axis) to add colour to the low range colour values.
- **Shadow:** Move the ring left or right to modify the luminance of the low range colour values.
- **Contrast:** Move the trackball right or left (x axis) to add colour to the contrast ratio.
- **Contrast:** Move the trackball up or down (y axis) to add colour to the contrast ratio.
- **Contrast:** Move the ring left or right to modify the luminance of the contrast ratio.
- **Brightness:** Move the trackball right or left (x axis) to add colour to the brightness channel.
- **Brightness:** Move the trackball up or down (y axis) to add colour to the brightness channel.
- **Brightness:** Move the ring left or right to modify the luminance of the brightness channel.



- **Shadow:** Move the trackball right or left (x axis) to add colour to the low range colour values.
- **Shadow:** Move the trackball up or down (y axis) to add colour to the low range colour values.
- **Shadow:** Move the ring left or right to modify the luminance of the low range colour values.
- **Midtones:** Move the trackball right or left (x axis) to add colour to the mid range colour values.
- **Midtones:** Move the trackball up or down (y axis) to add colour to the mid range colour values.
- **Midtones:** Move the ring left or right to modify the luminance of the mid range colour values.
- **Highlights:** Move the trackball right or left (x axis) to add colour to the high range colour values.
- **Highlights:** Move the trackball up or down (y axis) to add colour to the high range colour values.
- **Highlights:** Move the ring left or right to modify the luminance of the mid range colour values.



- **InPrimary:** Toggle input primary grading mode.
- **OutPrimary:** Enable output primary grading mode.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.

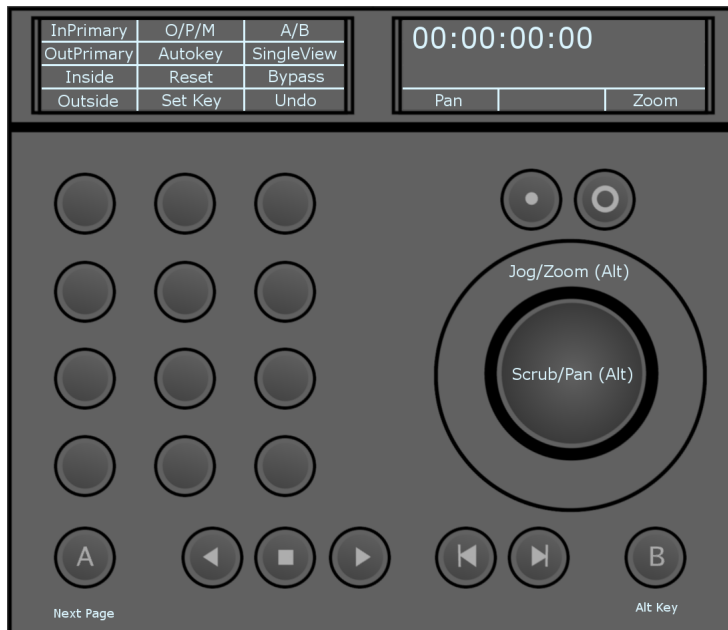
NOTE Inside grading is enabled by default.
- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Once enabled, single-press to select outside grading, to edit your grade.
- **Grade:** Access the Colour/Grade menu.
- **PanScan:** Access the Image/Reposition menu.
- **Geometry:** Enable the draw geometry mode in the secondaries menu. The fourth row of functions on the module is dynamically updated to display the rectangle, circle and wipe options. Pressing the corresponding button enables you to add the desired geometry.
- **Prefs:** Access the preferences functions.
- **Curves:** Access the Colour/Curves menu.
- **Keyer:** Enable the keyer in the secondaries menu. The default behavior is to enable the HLS keyer. Pressing Keyer again enables the diamond keyer.
- **Editing:** Access the Editing/Timeline menu.
- **Undo:** Undo the last operation performed. Pressing the B button changes the function of the Undo button to Redo. The panel display is be updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).

InPrimary	Grade	Curves
OutPrimary	PanScan	Keyer
Inside	Geometry	Editing
Outside	Prefs	Redo

- **Confirm:** When the Lustre UI prompts you to confirm an operation, the Undo button is automatically updated to display Confirm. Press to confirm the operation.

InPrimary	Grade	Curves
OutPrimary	PanScan	Keyer
Inside	Geometry	Editing
Outside	Prefs	Confirm

Module 3 (MF) - Page 2 of 3



- **InPrimary:** Enable input primary grading mode.
- **OutPrimary:** Enable output primary grading mode.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select Inside Grading and edit your grade.

NOTE Inside grading is enabled by default.

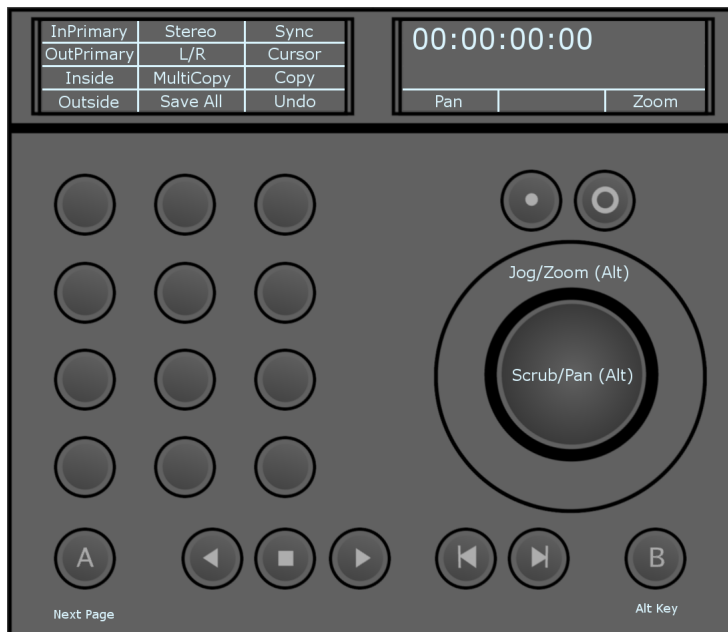
- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.
- **O/P/M:** Toggle between output, print and matte views.
- **Autokey:** Enable/disable Autokey.
- **Reset:** Press once to reset the currently selected grading tool. Press twice to reset all grading tools.
- **SetKey:** Set a keyframe at the current position on the currently selected channel. Pressing the B button changes the function of the SetKey button to SetKey All. The panel display is updated.

InPrimary	O/P/M	A/B
OutPrimary	Autokey	SingleView
Inside	Reset	Bypass
Outside	SetKeyAll	Undo

- **SetKeyAll:** Set a keyframe at the current position on all channels.
- **A/B:** Toggle A/B playheads.
- **SingleView:** Toggle between single, dual and multi views, as defined under the preferences.
- **Bypass:** Press once to bypass the currently selected grading tool. Press twice to bypass all grading tools.
- **Undo:** Undo the last operation performed. Pressing the B button will change the function of the Undo button to Redo. The panel display is updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).

InPrimary	O/P/M	A/B
OutPrimary	Autokey	SingleView
Inside	Reset	Bypass
Outside	SetKey	Redo

Module 3 (MF) - Page 3 of 3



- **InPrimary:** Enable input primary grading mode.
- **OutPrimary:** Enable output primary grading mode.
- **Inside:** Double-press to enable Inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.

NOTE Inside grading is enabled by default.

- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Once enabled, single-press to select outside grading, to edit your grade.
- **Stereo:** Enable stereoscopy.
- **L/R:** Toggle between right eye view and left eye view modes (when working with stereoscopic footage).

- **MultiCopy:** Enter multi copy mode. When in multi copy mode, turn the ring to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button is automatically updated to display Apply. Press Apply to confirm and repeat the process for other shots as needed. To exit multi copy mode, press the MultiCopy button again.

InPrimary	Stereo	Sync
OutPrimary	L/R	Cursor
Inside	MultiCopy	Copy
Outside	Save All	Apply

- **SaveAll:** Save your current cut and grade.
- **Sync:** Sync your left and right eyes when working with stereoscopic footage. When in sync, any operation performed on the left eye is also applied to the right eye.
- **Cursor:** Enable cursor mode. When cursor mode is enabled, the trackball is used to move the cursor in the UI. In cursor mode, the Reset Trackball button acts as the left mouse button and the Reset Ring button acts as the right mouse button.
- **Copy:** Enter copy mode. When in copy mode, turn the ring to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button is automatically updated to display Apply. Press Apply to confirm the copy operation. Once the copy operation confirmed, you automatically exit copy mode.

InPrimary	Stereo	Sync
OutPrimary	L/R	Cursor
Inside	MultiCopy	Copy
Outside	Save All	Apply

- **Undo:** Undo the last operation performed. Pressing the B button will change the function of the Undo button to Redo. The panel display will be updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).

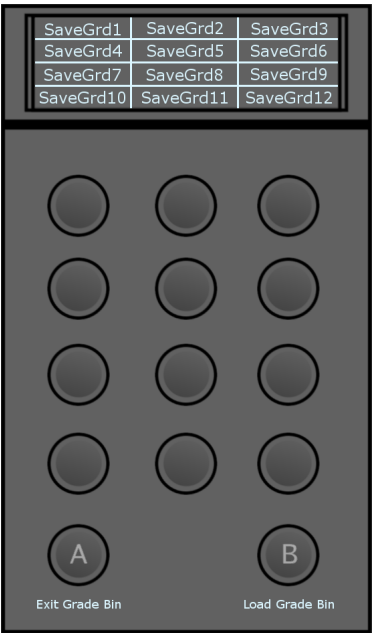
InPrimary	Stereo	Sync
OutPrimary	L/R	Cursor
Inside	MultiCopy	Copy
Outside	Save All	Undo

Module 4 (BT) - Page 1 of 6

Secondaries List (4 pages, 12 secondaries per page).

Module 4 (BT) - Page 6 of 6

Grade Bin - Save

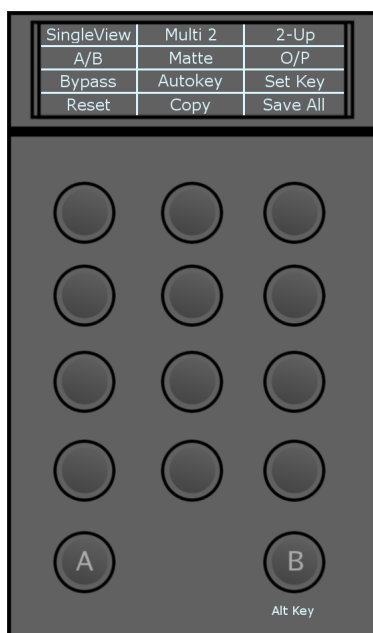


- **A Button:** Exit the Grade Bin.
- **B Button:** Toggle between load mode and save mode in the Grade Bin.

NOTE The trackball of the MF Module navigates the Grade Bin when in Grade Bin mode.

Optional 2nd BT Module - Page 1 of 1

It is recommended to attach a second BT module, which is mapped to give you access to many of the most used functions at all times. These functions correspond to the second and third page of the MF module.



- **SingleView:** Toggle between single, dual and multi views, as defined under the preferences.
- **A/B:** Toggle A/B playheads. Pressing the B button will change the function of the A/B button to L/R. The panel display is updated.



- **L/R:** Toggle between right eye view and left eye view modes (when working with stereoscopic footage).
- **Bypass:** Press once to bypass the currently selected grading tool. Press twice to bypass all grading tools.
- **Reset:** Press once to reset the currently selected grading tool. Press twice to reset all grading tools.
- **Multi 2:** Toggle the number of active viewports when in Multi View. Options are:
 - 2
 - 4
 - 9
 - 16
- **Matte:** Enable/disable matte view.
- **Autokey:** Enable/disable Autokey.
- **Copy:** Enter copy mode. When in copy mode, turn the ring on the MF module to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button on the MF module is automatically updated to display Apply. Press Apply to confirm. Once the copy operation confirmed, you automatically exit copy mode. Pressing the B button changes the function of the Copy button to MultiCopy. The panel display is updated.

SingleView	Multi 2	2-Up
A/B	Matte	O/P
Bypass	Autokey	SetKey
Reset	MultiCopy	Save All

- **MultiCopy:** When in multi copy mode, turn the ring on the MF module to cycle your shots forward or backwards to copy the selected grade to your current shot. When you release the ring, the Undo button on the MF module is automatically updated to display Apply. Press Apply to confirm and repeat the process for other shots as needed. To exit multi copy mode, press the MultiCopy button again.
- **2-up:** Toggle the display mode when in dual view. Options are:

For A/B

- 2-up
- HorizWipe
- VertWipe

For L/R

- 2-up
- HorizWipe
- VertWipe
- Blend

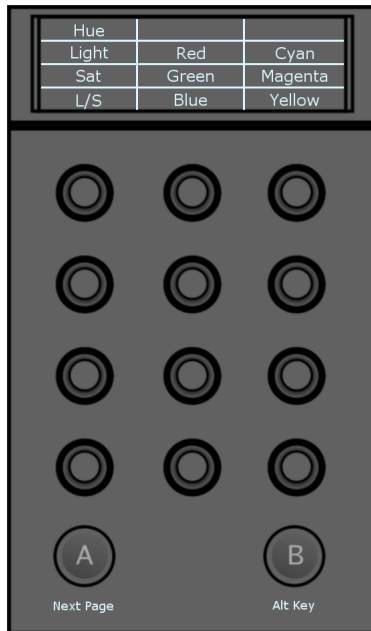
- **O/P:** Toggle between output and print views.
- **SetKey:** Set a keyframe at the current position on the currently selected channel. Pressing the B button will change the function of the SetKey button to SetKeyAll. The panel display is updated.

SingleView	Multi 2	2-Up
A/B	Matte	O/P
Bypass	Autokey	SetKeyAll
Reset	Copy	Save All

- **SetKeyAll:** Set a keyframe at the current position on all channels.
- **Save All:** Save your current cut and grade.
- **B Button:** Enable alternate functionality for specified buttons.

Curves Layout

Module 1 (KB) - Page 1 of 2

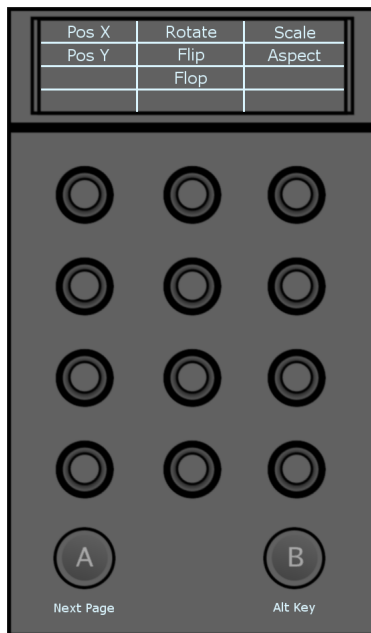


- **Hue:** Press on the knob to enable the hue curve. Turning the knob left or right will raise or lower the Hue across the entire spectrum.
- **Lightness:** Press on the knob to enable the lightness curve. Turning the knob left or right will raise or lower the lightness across the entire spectrum.
- **Saturation:** Press on the knob to enable the saturation curve. Turning the knob will raise or lower the saturation across the entire spectrum.
- **L/S:** Press on the knob to enable the lightness - saturation curve. Turning the knob left or right will raise or lower the lightness - saturation across the entire spectrum.
- **Red:** Adjust the red point on the hue, lightness or saturation curve, according to the selected curve.
- **Green:** Adjust the green point on the hue, lightness or saturation curve, according to the selected curve.
- **Blue:** Adjust the blue point on the hue, lightness or saturation curve, according to the selected curve.
- **Cyan:** Adjust the cyan point on the hue, lightness or saturation curve, according to the selected curve.
- **Magenta:** Adjust the magenta point on the hue, lightness or saturation curve, according to the selected curve.
- **Yellow:** Adjust the yellow point on the hue, lightness or saturation curve, according to the selected curve.

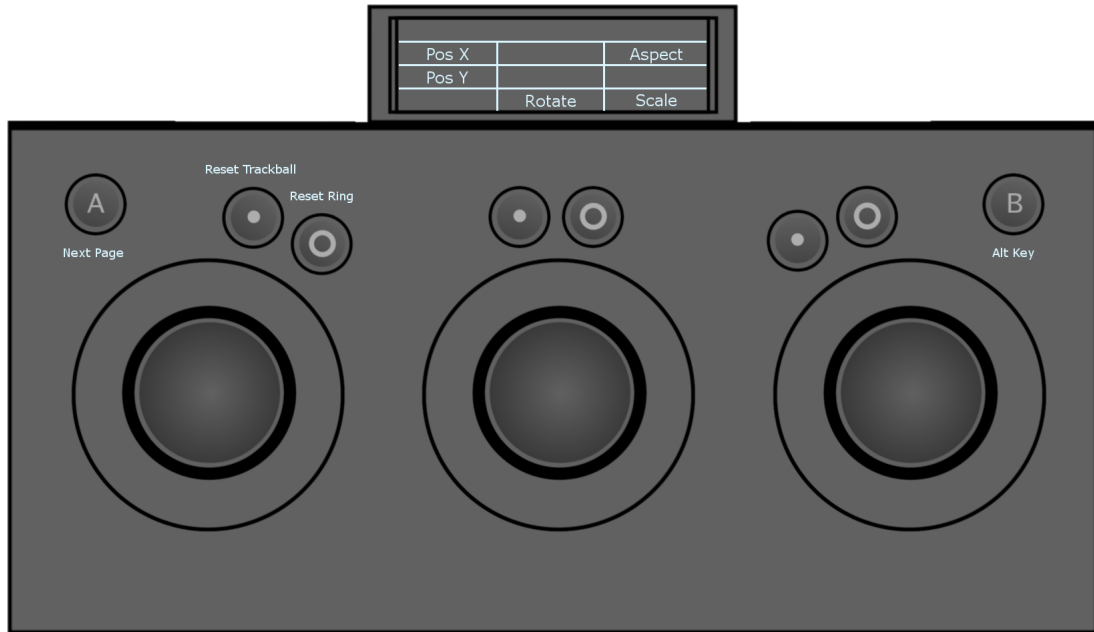
Pan & Scan Layout

Module 1 (KB) - Page 1 of 2

Pan & Scan mode accesses the Image/Reposition menu.



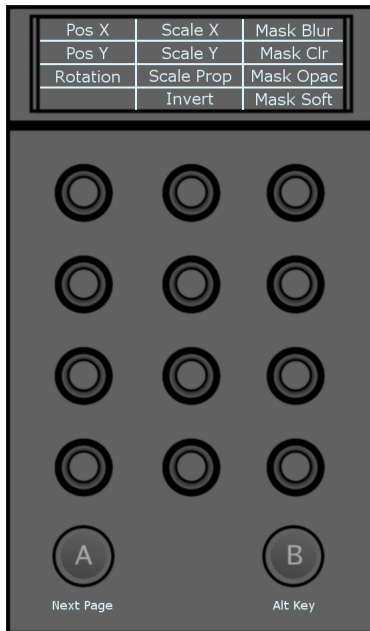
- **Pos X:** Move your image on the X axis.
- **Pos Y:** Move your image on the Y axis.
- **Rotate :** Rotate your image.
- **Flip:** Press the knob to enable/disable Flip.
- **Flop:** Press the knob to enable/disable Flop.
- **Scale:** Scale your image proportionally.
- **Aspect:** Scale your image in X.



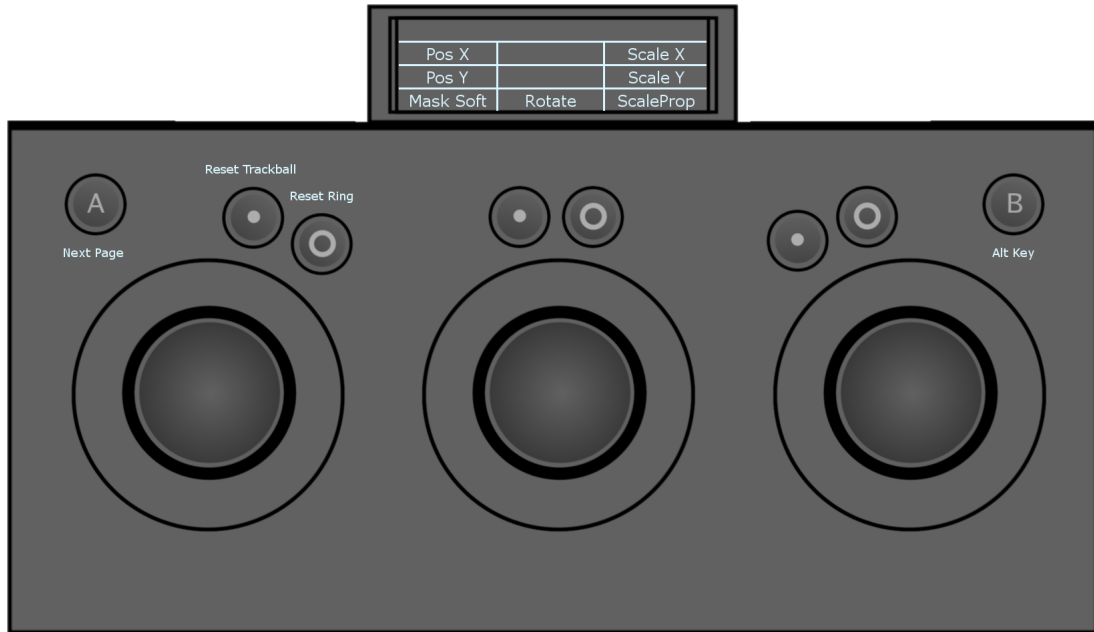
- **Pos X:** Move the trackball left or right to move your image on the X axis.
- **Pos Y:** Move the trackball left or right to move your image on the Y axis.
- **Rotate:** Turn the ring to rotate your image.
- **Aspect:** Move the trackball left or right to scale your image in X.
- **Scale:** Turn the ring to scale your image proportionally.

Geometry Layout

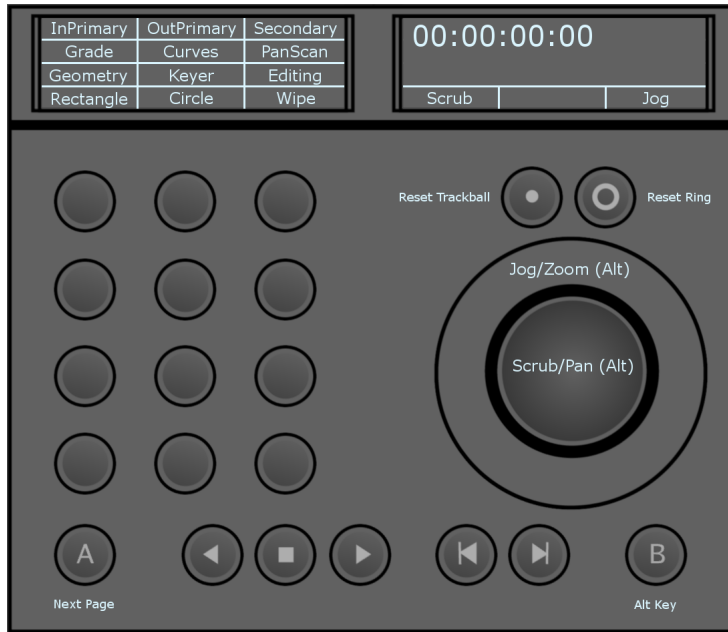
Module 1 (KB) - Page 1 of 2



- **Pos X:** Move your geometry on the X axis.
- **Pos Y:** Move your geometry on the Y axis.
- **Rotation:** Rotate your geometry.
- **Scale X:** Scale your geometry in X.
- **Scale Y:** Scale your geometry in Y.
- **Scale Prop:** Scale your geometry proportionally.
- **Invert:** Press the knob to invert your geometry.
- **Mask Blur:** Set the level of mask blur.
- **Mask Clr:** Set the level of mask colour.
- **Mask Opac:** Set the level of mask opacity.
- **Mask Soft:** Set the level of mask softness.



- **Pos X:** Move the trackball left or right to move your geometry on the X axis.
- **Pos Y:** Move the trackball left or right to move your geometry on the Y axis.
- **Mask Soft:** Turn the ring to add/remove softness to your mask.
- **Rotate:** Turn the ring to rotate your geometry.
- **Scale X:** Move the trackball left or right to scale your geometry in X.
- **Scale Y:** Move the trackball left or right to scale your geometry in Y.
- **ScaleProp:** Turn the ring to scale your geometry proportionally.

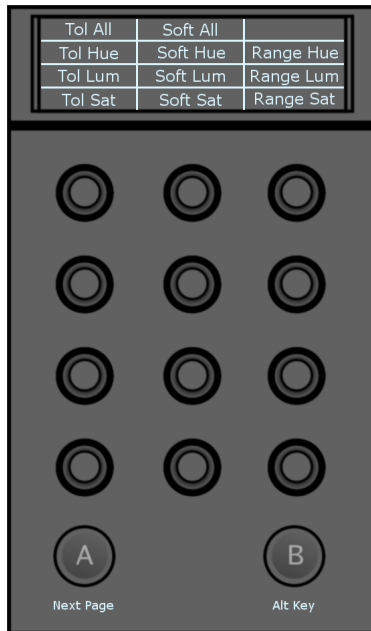


NOTE The bottom row functions of the MF module in Geometry mode (Rectangle, Circle, Wipe) appear when you press the Geometry button. Once you press either Rectangle, Circle or Wipe to add the desired shape or start editing an existing shape, the bottom row reverts back to its default functions (Prefs, Undo, Enter). To add another shape, press Geometry again and press the button corresponding to the shape you want to add.

- **InPrimary:** Toggle input primary and output primary grading modes.
- **Grade:** Access the Colour/Grade menu.
- **Geometry:** Enable the draw geometry mode in the Secondaries menu. The fourth row of functions on the module is dynamically updated to display the rectangle, circle and wipe options. Pressing the corresponding button enables you to add the desired geometry.
- **Rectangle:** Add a default rectangle.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.
- **Curves:** Access the Colour/Curves menu.
- **Keyer:** Enable the keyer in the secondaries menu. The default behavior is to enable the HLS keyer. Pressing Keyer again enables the diamond keyer.
- **Circle:** Add a default circle.
- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Single-press to select outside grading, to edit your grade.
- **PanScan:** Access the Image/Reposition menu.
- **Editing:** Access the Editing/Timeline menu.
- **Wipe:** Add a default wipe.

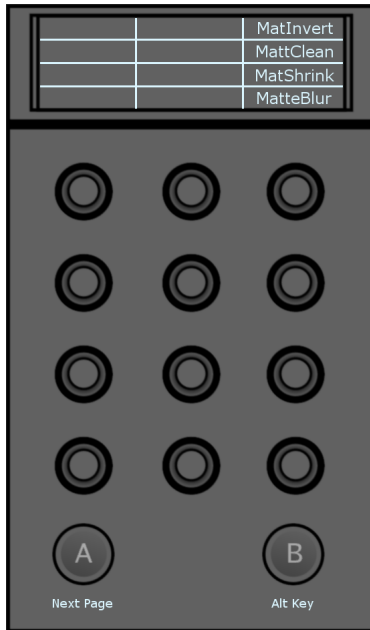
HLS Keyer Layout

Module 1 (KB) - Page 1 of 2



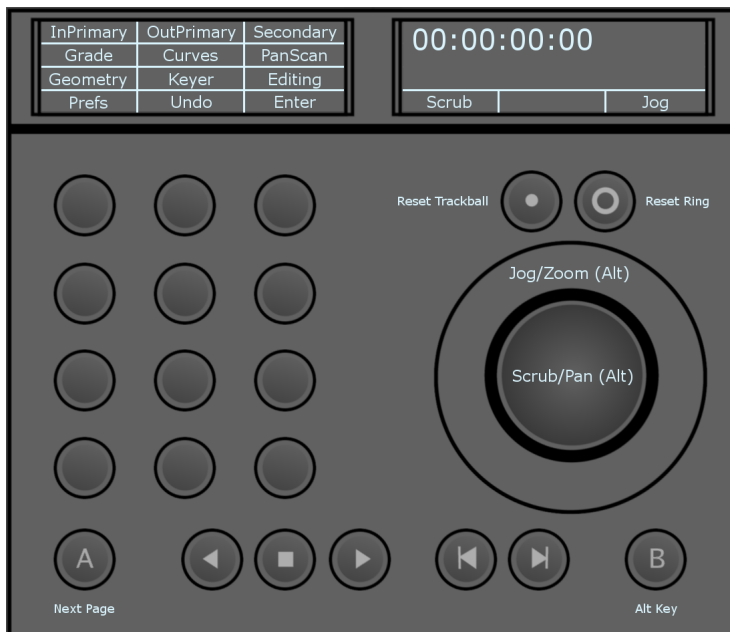
- **TolAll:** Set the global tolerance for your key (hue, luminance and saturation channels).
- **TolHue:** Set the tolerance for the hue channel.
- **TolLum:** Set the tolerance for the luminance channel.
- **TolSat:** Set the tolerance for the saturation channel.
- **SoftAll:** Set the global softness for your key (hue, luminance and saturation channels).
- **SoftHue:** Set the softness for the hue channel.
- **SoftLum:** Set the softness for the luminance channel.
- **SoftSat:** Set the softness for the saturation channel.
- **Range Hue:** Offset the tolerance range for the hue channel.
- **Range Lum:** Offset the tolerance range for the luminance channel.
- **Range Sat:** Offset the tolerance range for the saturation channel.

Module 1 (KB) - Page 2 of 2



- **MatInvert:** Press the knob to invert your matte.
- **MatClean:** Set the matte cleanup value.
- **MatShrink:** Set the matte shrink value.
- **MatteBlur:** Set the matte blur value.

Module 3 (MF) - Page 1 of 4

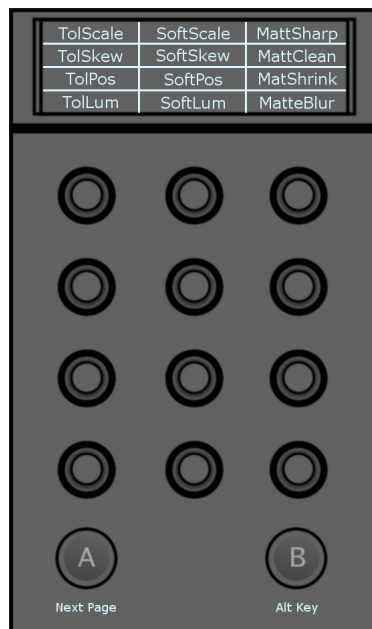


- **InPrimary:** Toggle input primary and output Primary grading modes.
- **Grade:** Access the Colour/Grade menu.

- **Geometry:** Enable the draw geometry mode in the Secondaries menu. The fourth row of functions on the module is dynamically updated to display the rectangle, circle and wipe options. Pressing the corresponding button enables you to add the desired geometry.
- **Prefs:** Access the preferences functions.
- **Inside:** Double press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single press to select inside grading and edit your grade.
- **Curves:** Access the Colour/Curves menu.
- **Keyer:** Enable the keyer in the Secondaries menu. The default behavior is to enable the HLS keyer. Pressing Keyer again enables the diamond keyer.
- **Undo:** Undo the last operation performed. Pressing the B button will change the function of the Undo button to Redo. The panel display will be updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).
- **Outside:** Double press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Single press to select outside grading, to edit your grade.
- **PanScan:** Access the Image/Reposition menu.
- **Editing:** Access the Editing/Timeline menu.
- **Enter:** Confirm operations.

Diamond Keyer Layout

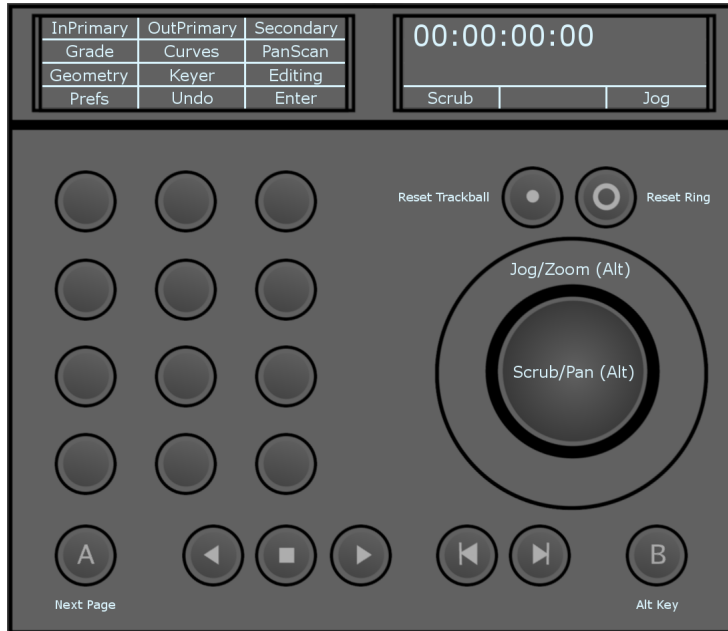
Module 1 (KB) - Page 1 of 2



- **TolScale:** Set the tolerance scale value.
- **TolSkew:** Set the horizontal tolerance skew value.
- **TolPos:** Set the tolerance position value.
- **TolLum:** Set the tolerance luminance value.
- **SoftScale:** Set the softness scale value.

- **SoftSkew:** Set the horizontal softness skew value.
- **SoftPos:** Set the softness position value.
- **SoftLum:** Set the softness luminance value.
- **MattSharp:** Set the matte sharpness value.
- **MattClean:** Set the matte cleanup value.
- **MatShrink:** Set the matte shrink value.
- **MatteBlur:** Set the matte blur value.

Module 3 (MF) - Page 1 of 4

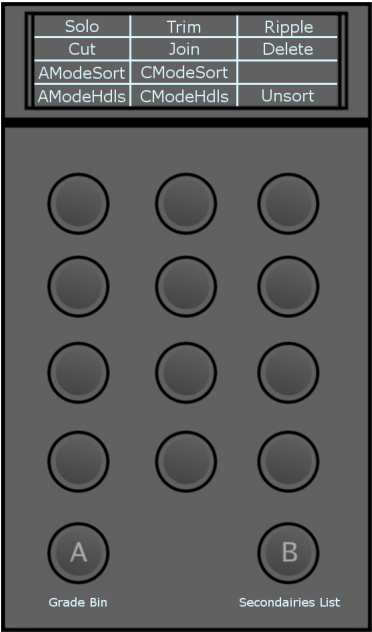


- **InPrimary:** Toggle input primary and output primary grading modes.
- **Grade:** Access the Colour/Grade menu.
- **Geometry:** Enable the draw geometry mode in the secondaries menu. The fourth row of functions on the module is dynamically updated to display the rectangle, circle and wipe options. Pressing the corresponding button enables you to add the desired geometry.
- **Prefs:** Access the preferences functions.
- **Inside:** Double-press to enable inside grading in secondary mode (grading affects the inside of your shape) for the currently selected shape. Inside grading is enabled by default. Single-press to select inside grading and edit your grade.
- **Curves:** Access the Colour/Curves menu.
- **Keyer:** Enable the keyer in the secondaries menu. The default behavior is to enable the HLS keyer. Pressing Keyer again enables the HLS keyer.
- **Undo:** Undo the last operation performed. Pressing the B button will change the function of the Undo button to Redo. The panel display will be updated. Pressing the B button and Redo will redo the last operation (if you previously undid it).
- **Outside:** Double-press to enable outside grading in secondary mode (grading affects the outside of your shape) for the currently selected shape. Single-press to select outside grading, and edit your grade.
- **PanScan:** Access the Image/Reposition menu.
- **Editing:** Access the Editing/Timeline menu.

- **Enter:** Confirm operations.

Editing Layout

Module 4 (BT) - Page 1 of 1



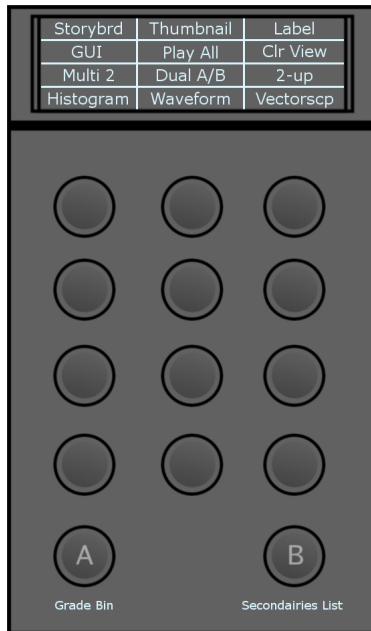
- **Solo:** Solo the currently selected track/layer.
- **Cut:** Insert a cut at the current location of the positioner.
- **AModeSort:** Enable A-mode timeline Sort.
- **AModeHdls:** Enable A-mode timeline Sort with handles.
- **Trim:** Enable trim mode.
- **Join:** Join the timeline segment on which the positioner is parked with the segment immediately succeeding it.
- **CModeSort:** Enable C-mode timeline Sort.
- **CModeHdls:** Enable C-mode timeline Sort with handles.
- **Ripple:** Toggle between ripple off, ripple start and ripple end modes.
- **Delete:** Delete the timeline segment on which the positioner is parked.

NOTE

- When in Editing mode, pressing the B button and turning the ring on the MF panel enables timeline zoom in and out.
 - Pressing the B button and moving the trackball enables you to move the timeline positioner's focus point up or down.
-

Preferences Layout

Module 4 (BT) - Page 1



- **Storybrd:** Enable/disable the storyboard.
- **GUI:** Enable/disable onscreen GUI hiding.
- **Multi 2:** Toggle the number of active viewports when in multi view. Options are:
 - 2
 - 4
 - 9
 - 16
- **Histogram:** View/hide the histogram.
- **Thumbnail:** Enable/disable auto thumbnail refresh.
- **Play All:** Toggle play modes. Options are:
 - Play All (plays full timeline).
 - Play Shot (plays current shot).
 - PlayInOut (plays the interval between the In and Out marks).
- **Dual A/B:** Toggle the active sources displayed when in dual view. Options are: A/B or L/R.
- **Waveform:** Display/hide the waveforms in the audio tracks.
- **Label:** Enable/disable the image label.
- **Clr View:** Toggle single channel views. Options are:
 - Colour (all channels)
 - Red
 - Green
 - Blue
 - Luminance

- **2-up:** Toggle the display mode when in dual view. Options are:

For A/B

- 2-up
- HorizWipe
- VertWipe

For L/R

- 2-up
- HorizWipe
- VertWipe
- Blend

- **Vectorscp:** Display/hide the vectorscope.

Troubleshooting

In the event that one or more of your panel modules are not recognized by Lustre, restarting the background service that manages the interactions between Lustre and the Tangent Element Control Surface can resolve the issue.

To restart the background service:

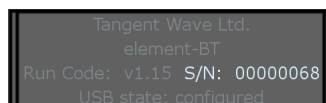
- 1 Exit Lustre.
- 2 Open a shell on your Linux machine.
- 3 Login as root.
- 4 Type: */etc/init.d/tangenthub restart*
- 5 Launch Lustre.

All of your module panels should now be recognized.

If the above procedure does not resolve the issue, you can manually connect the Control Surface to your software. To do this, you must define each module's unique ID number in the panel-list.xml file within the Lustre filesystem for the panel to be recognized.

To manually install the panel:

- 1 Plug and connect the four or five modules (depending on your setup) of your Tangent Element Control Panel to a power outlet and to your USB hub.
- 2 Once the modules are booted up and are displaying the Tangent logo, hit the A button on each module to display its unique ID number.



- 3 On your Linux machine, log in as root and use kEdit to edit the panel-list.xml file:
kedit /var/opt/Tangent/Hub/panel-list.xml

```

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<TangentWave fileType="PanelList" fileVersion="3.0">
  <Panel type="Element-Mf" number="1" serial="30"/>
  <Panel type="Element-Bt" number="1" serial="68"/>
  <Panel type="Element-Bt" number="2" serial="77"/>
  <Panel type="Element-Kb" number="1" serial="53"/>
  <Panel type="Element-Tk" number="1" serial="13"/>
  <Panel type="Wave"/>
  <Options>
    <DHCP enabled="true"/>
  </Options>
</TangentWave>

```

- 4 Add the corresponding ID numbers to the panel-list.xml file.

NOTE In a four module setup, the line <Panel type= "Element-BT" number="2" serial="00"/> should be left blank.

- 5 Save the file.

The Tangent Element Control Surface should be now recognized by Lustre.

The Autodesk Control Surface

34

Autodesk control surface:overviewcontrol surfaces:Autodesk control surfaceThe Autodesk® control surface provides improved interactivity when colour grading film and video footage. You can perform many of the same tasks you do in the Autodesk Lustre® user interface using the control surface. The modular design of the control surface also allows you to work on different grading stages simultaneously. For example, you can perform curves grading while modifying the image lift.

The Autodesk control surface consists of three panels. Although licensed separately, they are designed to work together.

Connecting the Autodesk Control Surface

For information on connecting the control surface, refer to the *Autodesk Lustre Installation and Configuration Guide* for your operating system.

Autodesk Control Surface Technical Information

For technical information about the Autodesk control surface, see http://www.tangentdevices.co.uk/downloads_documents.asp. For those who wish to mount the Autodesk control surface in a desk, this link provides the precise dimensions of the panels in millimeters.

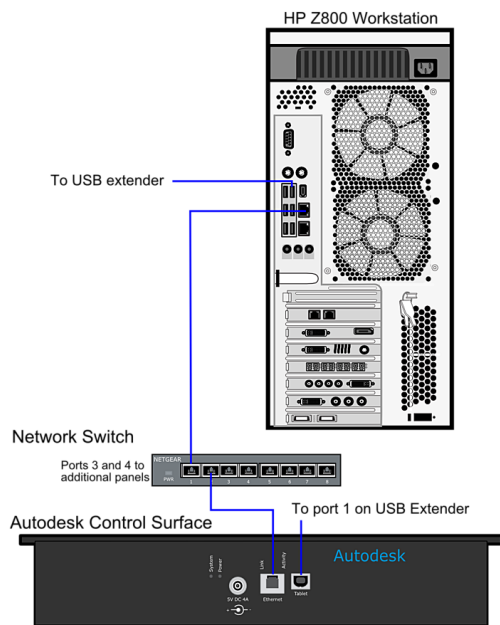
Consult the following table for the power consumption requirements of the Autodesk control surface.

Component	Quantity	Amps (120v)	Amps (240v)	Watts
Autodesk control surface panel	1	1.0	.5	120

Connecting the Autodesk Control Surface to a Lustre Workstation

Autodesk Control Surface:connecting;control surface:Autodesk Control Surface, connectingThe Autodesk Control Surface consists of three panels connected to the workstation's on-board GigE port 1 by way of the supplied network switch. The central panel requires an additional connection to the remote unit of the USB extender kit.

This section provides information on making the physical connections needed to operate the Autodesk Control Surface. For information on using the Control Surface, see the [Autodesk Control Surface User Guide](#).



NOTE

The illustration shows the central panel only (the Colour Grading panel). This panel is easily identified, since it has both an Ethernet network port and a USB connector. It is also the panel with the built-in tablet.

To connect the Autodesk Control Surface:

- 1 Connect each panel to a power supply using the AC power adapter cables.
- 2 Use network cables to connect each panel to the available ports in the network switch.
- 3 Connect the Colour Grading panel to the remote unit of the USB extender kit.
- 4 Use a network cable to connect an available port on the Netgear network switch to the workstation, as illustrated.

Assigning an IP Address to the Autodesk Control Surface

You must assign an IP address and subnet mask to the Autodesk Control Surface.

Assign the network port connected to the control surface with a static IP address that does not interfere with any of the IP addresses on your network.

To configure the Autodesk Control Surface:

- 1 Type:
`netedit /etc/sysconfig/network-scripts/ifcfg-eth<port#>`
- 2 Modify the IPADDR and NETMASK values. For example:

```
IPADDR=192.168.125.10
NETMASK=255.255.255.0
```

Configuring Lustre to Connect to the Autodesk Control Surface

To configure Lustre to use the Autodesk control surface:

- 1 Turn the power on to each of the modules and look at the top display panel on the module. It should display the panel name and ID.
- 2 After you install Lustre, open the init.config file located in /usr/autodesk/<lustre_version> with a text editor.
- 3 In the ControlSurface section of the init.config file of your project, enter the panel IDs for each panel.

```
ControlSurface
AutodeskPanels state="On"
PanelIDs function="<panel_ID>" grading="<panel_ID>" navigation="<panel_ID>"
```

- 4 Start Lustre. The following message should appear in each Console:

```
Panel #<panel_ID> is detected
```

This confirms that the Autodesk Control Surface is enabled.

Control Surface Panel Descriptions

Autodesk control surface:individual surface descriptionsEach of the three control surface panels are designed to perform different functions.

The following image shows the Navigation panel.

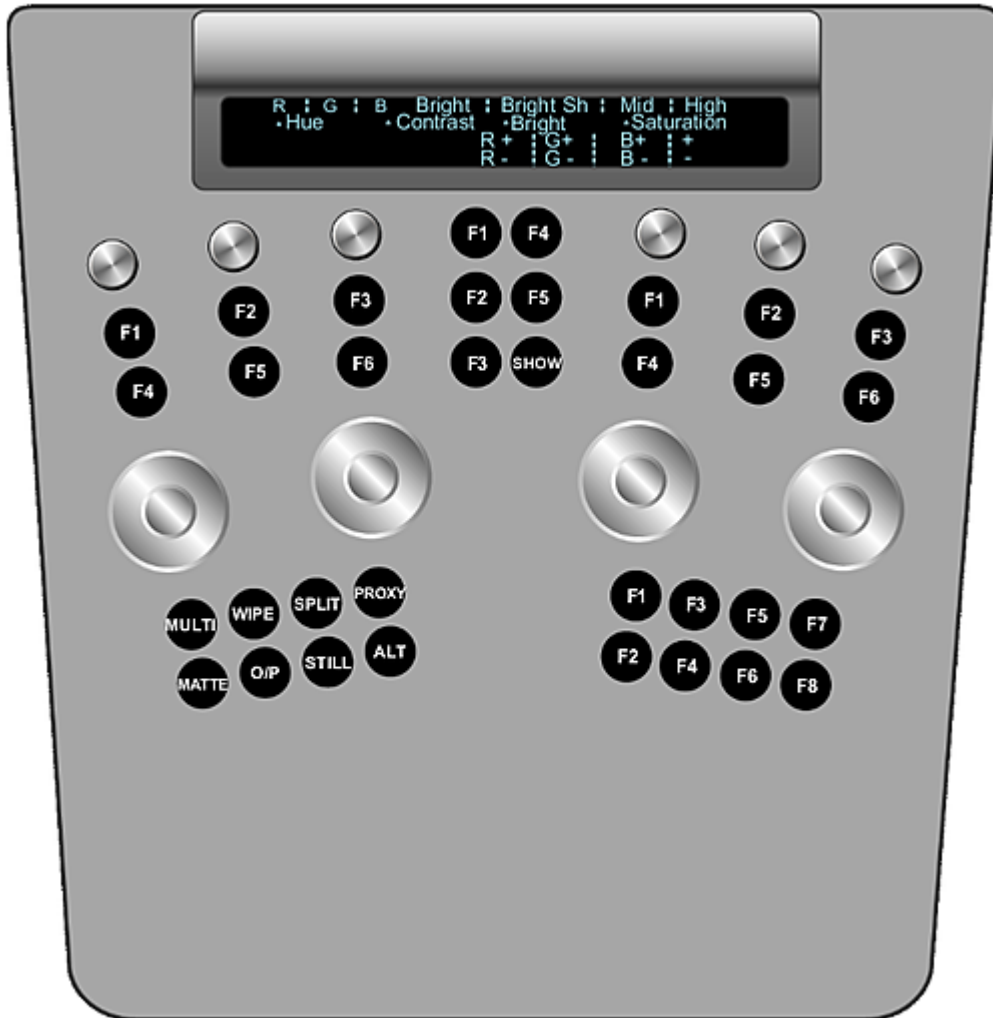


Use the Navigation panel to:

- Select menus. Pressing one of the menu buttons along the top of the panel activates a menu. For example, pressing the Grade button activates grading functionality.
- Reset or bypass the currently selected menu.
- Cache memory.
- Navigate the Storyboard.
- Pan and zoom the image.
- Copy grades.
- Activate mouse functionality.
- Add keyframes.
- Revert and compare grades.
- Toggle playback mode between Storyboard and clip loop.
- Switch playheads.
- Scroll shots.
- Undo and redo actions.
- Perform actions with the Grade bin.

- Adjust printer lights.
- Jump to specified frame number or timecode on the Storyboard.
- Show or hide user interface elements.
- Adjust the appearance of the panels.

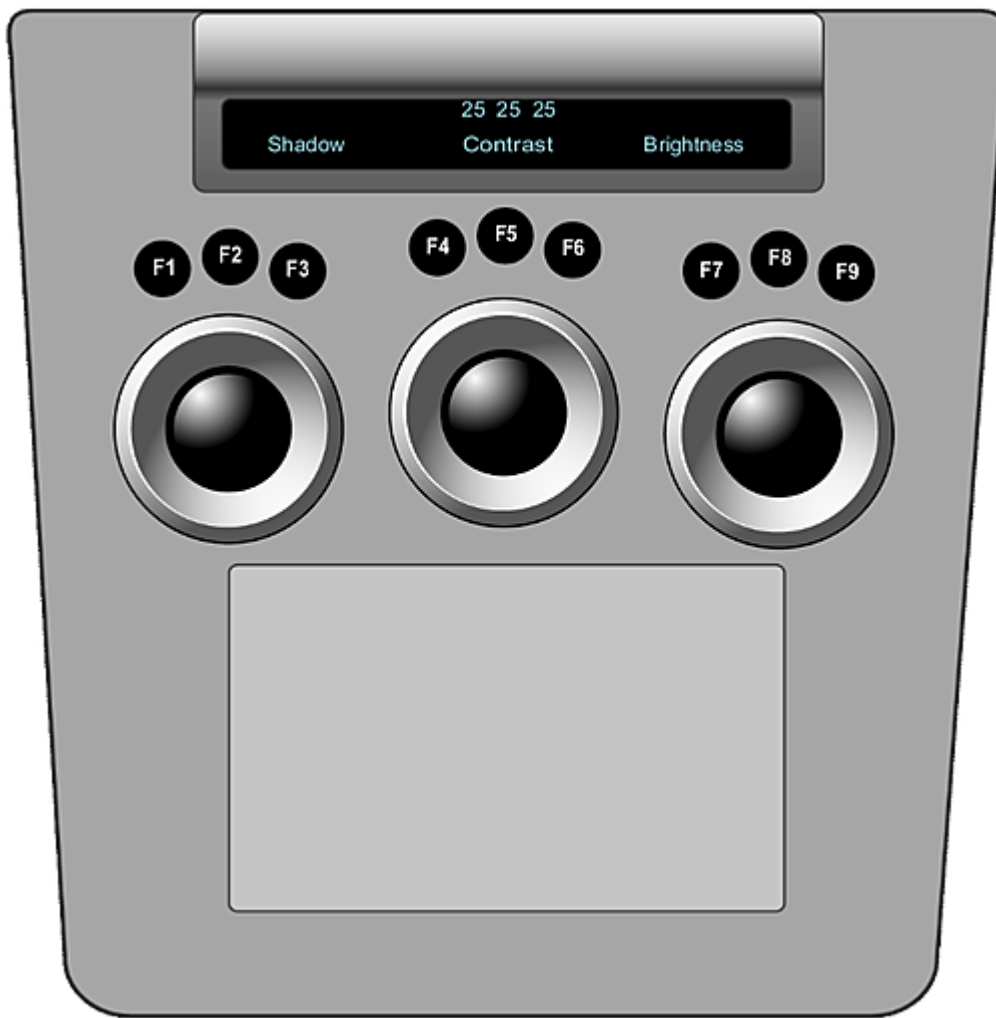
The following image shows the Function panel.



Use the Function panel to work in the menu you activated in the Navigation panel. For example, if you pressed the Key menu button in the Navigation panel, the functions for pulling a key are activated in the Function panel. The features available on the Function panel depend entirely on the menu selected in the Navigation panel. You can use the digital display at the top of the panel as a guide for understanding how functionality is distributed when a given menu is active.

You can also use the Function panel to set viewing modes. Some of the viewing functions included in the Function panel include Multi view, Dual view in 2-up mode, Dual view in Wipe mode, proxy view, output view, and print view.

The following image shows the Colour Grading panel.



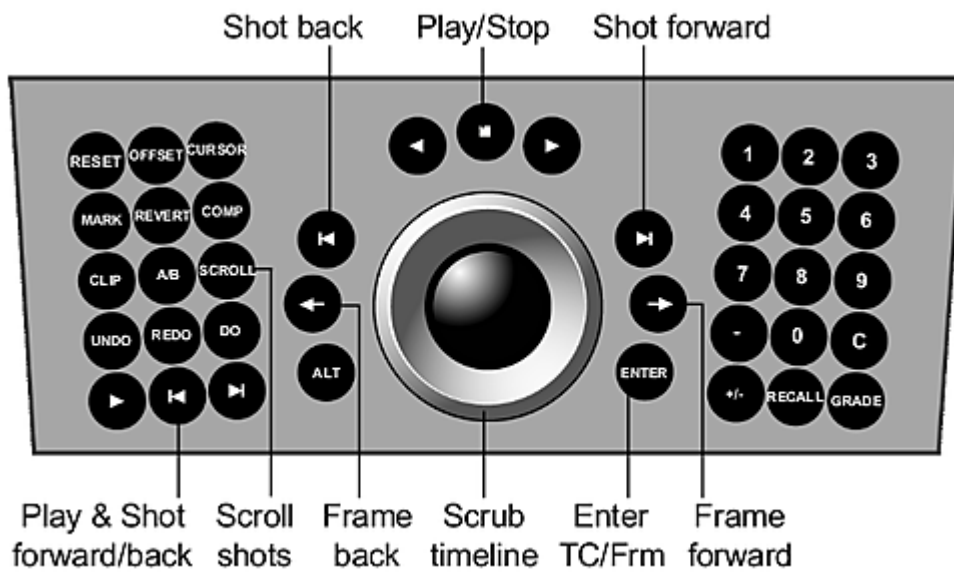
Use the Colour Grading panel for most grading functions. Colour grading functionality is split between the Colour Grading and the Function panels. The Colour Grading panel is always in grading mode. Depending on the colour space selected in the Setup Project menu, either Linear or Logarithmic functionality is available.

The Colour Grading panel also contains the tablet.

Navigating the Storyboard

Storyboard:navigating with the Autodesk control surfaceYou can use the Navigation panel to:

- Scrub the Storyboard.
- Scroll through the shots in the Storyboard.
- Toggle between the regular and large Storyboard viewing modes.
- Jump to a specified frame or timecode on the Storyboard.
- Jump ahead or back a frame at a time, or a shot at a time.
- Play forwards or backwards.



To scrub the Storyboard:

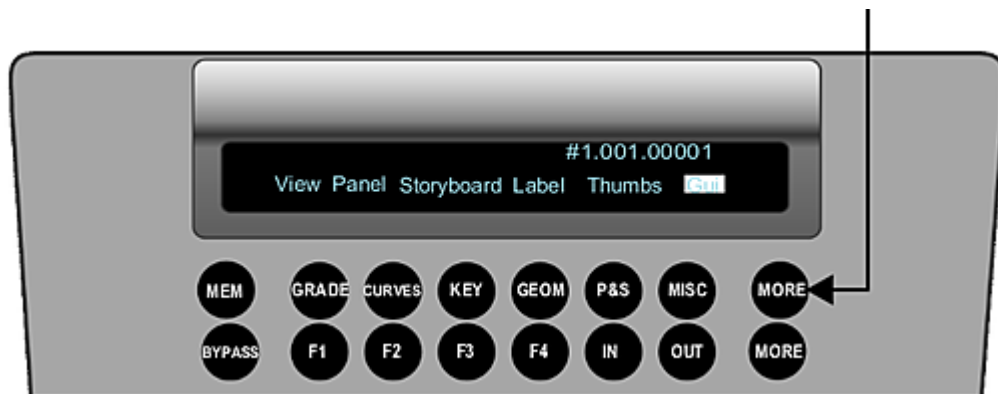
- 1 Use the ring portion of the trackball.

To scroll through shots on the Storyboard:

- 1 Press the Scroll button.
- 2 Use the ring portion of the trackball.
- 3 Press the Scroll or Do button to confirm the move.

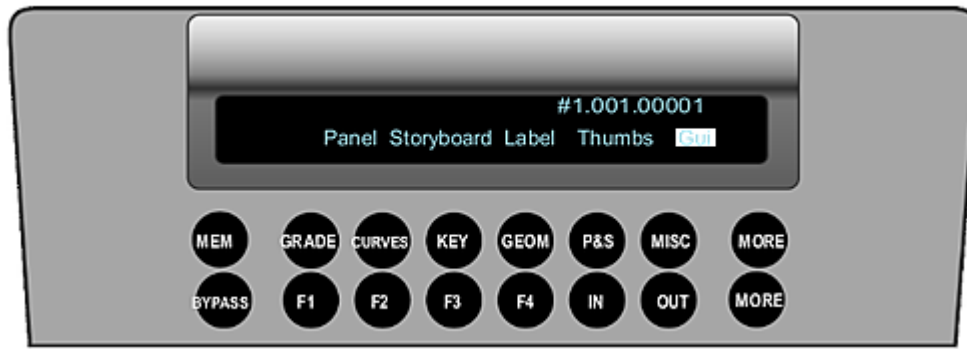
To switch between regular and large Storyboard viewing modes:

- 1 Press the top More button on the Navigation panel.



The Label, Thumbnails, and GUI options appear in the digital display at the top of the panel. The location of each option in the digital display reflects their button position on the panel.

- 2 If the Storyboard option does not appear, press the button for Thumbs (the P&S button) to display Storyboard thumbnails. This makes the Storyboard option appear in the digital display.



- 3 Press the button for Storyboard (the Key button). This switches Storyboard thumbnails to the large Storyboard option.

NOTE This is equivalent to using the **Q** hotkey.

To jump to a specified frame on the Storyboard:

- 1 Press the Enter button.
- 2 Do one of the following:
 - To jump ahead, enter the frame number using the numeric pad on the right side of the panel.
 - To jump back, press the +/- button on the numeric pad and then enter the frame number.
- 3 Press the Enter button to jump to the specified frame.

To jump to a specified timecode on the Storyboard:

- 1 Press the Enter button.
- 2 Enter a timecode using the numeric pad on the right side of the panel.
- 3 Press the Enter button to jump to the specified timecode.

To jump back or ahead a frame at a time:

- 1 To jump back a frame, do one of the following:
 - Press the Frame Back button (left arrow button to the left of the trackball).
 - Simultaneously press the Shot Back button (below the Redo button) and the Play button (below the Do button).
- 2 To jump ahead a frame, do one of the following:
 - Press the Frame Forward button (right arrow button to the right of the trackball).
 - Simultaneously press the Shot Forward button (below the Undo button) and the Play button (below the Do button).

To jump to the beginning or end of a shot:

- 1 To jump to the first frame of the shot, press either of the two Shot Back buttons. One button is located to the left of the trackball, and the other is below the Redo button.
- 2 To jump to the last frame of the shot, press either of the two Shot Forward buttons. One button is located to the right of the trackball, and the other is below the Do button.

To play forwards or backwards:

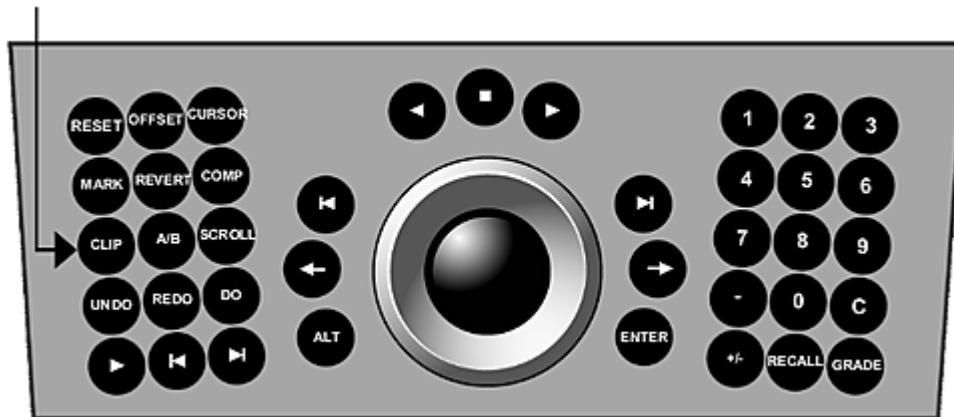
- 1 To play the Storyboard forward, do one of the following:
 - Press the Play Forward button (above the trackball).
 - Press the Spacebar-style Play button (below the Undo button). This button operates like the Spacebar on the keyboard, in that you use it both to start and stop playback.
- 2 To play the Storyboard backwards, press the Play Backwards button (above the trackball).
- 3 To stop playback, do one of the following:
 - Press the Stop button (above the trackball).
 - Press the Spacebar-style Play button.

Toggling Play Modes

looping:using the Autodesk control surfaceplay modes:toggling with the Autodesk control surfaceYou can toggle the playback mode between looping a shot or looping the entire Storyboard.

To toggle play modes:

- 1 Press the Clip button on the Navigation panel.



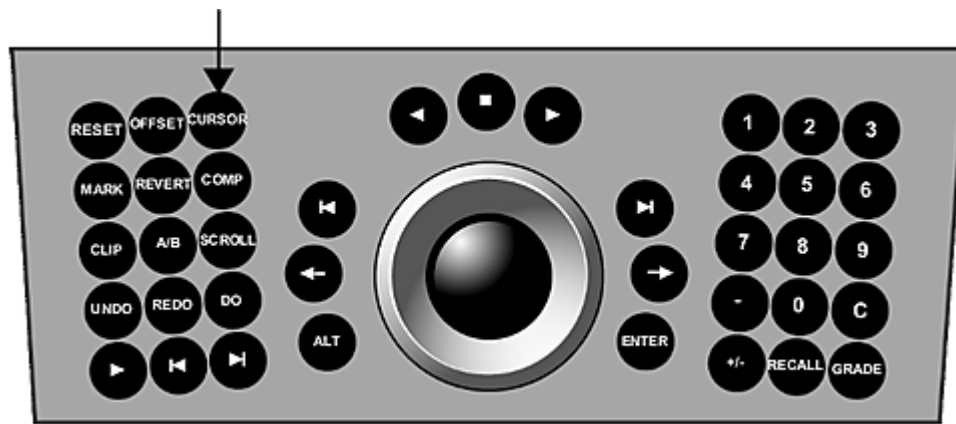
This button corresponds to the Play Mode button in the user interface.

Activating Mouse Functionality

cursor:activating on the Autodesk control surfacemouse functionality:activating on the Autodesk control surfaceYou can enable mouse functionality on the Navigation panel.

To activate mouse functionality:

- 1 Press the Cursor button on the Navigation panel.

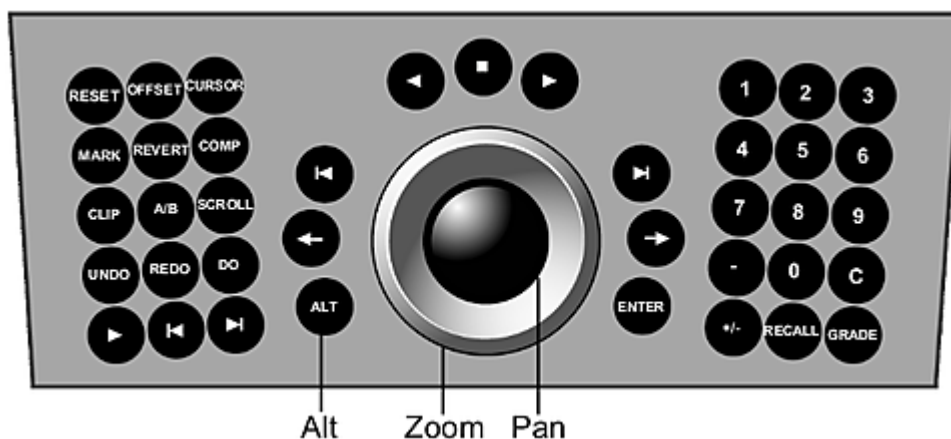


2 Use the panel's features as follows.

Use the:	As the:
Trackball	Mouse.
Backward play button	Left mouse button.
Stop button	Middle mouse button.
Forward play button	Right mouse button.

Panning and Zooming the Image

zooming:with the Autodesk control surfacepanning:with the Autodesk control surfaceYou can use the Navigation panel to pan and zoom the image.



To zoom the image:

- 1 Hold down the ALT button on the Navigation panel and use the ring on the trackball to zoom in and out.

To pan the image:

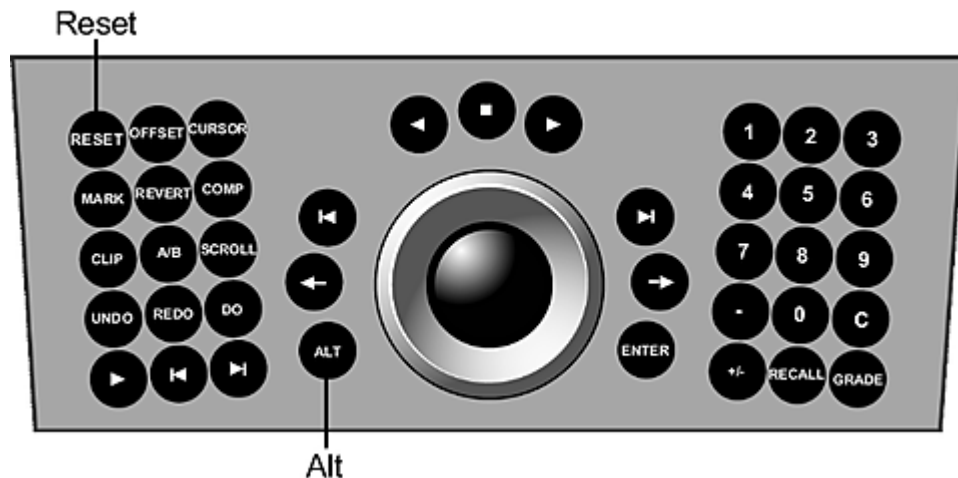
- 1 Hold down the ALT button on the Navigation panel and use the jog ball on the trackball to pan the image.

Resetting Zoom and Pan

You can now reset the zoom and pan.

To reset the zoom and pan:

- 1 Hold down the ALT button on the Navigation panel and press the Reset button.



NOTE The zoom and pan are always reset together.

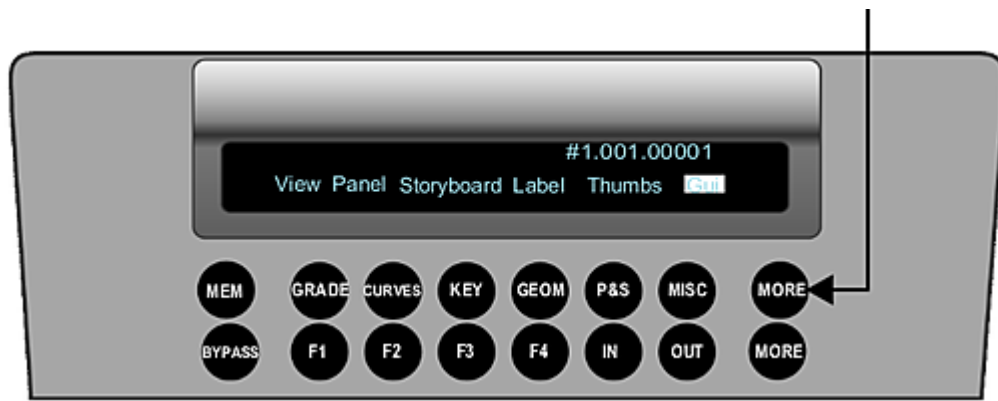
Customizing the View

customizing;the view with the Autodesk control surfaceview options:accessing with the Autodesk control surfaceThere are options for customizing the view on both the Navigation panel and the Function panel.

When working with secondaries, users can use the Function panel to view them in Saturated Mask view or Matte view. Saturated Mask view displays the range of colours you define through a greyscale image. The unselected colours remain grey. Matte view displays a black and white template indicating which parts of the image are transparent (black), and which are opaque and selected (white).

To access view options available on the Navigation panel:

- 1 Press the top MORE button on the Navigation panel.



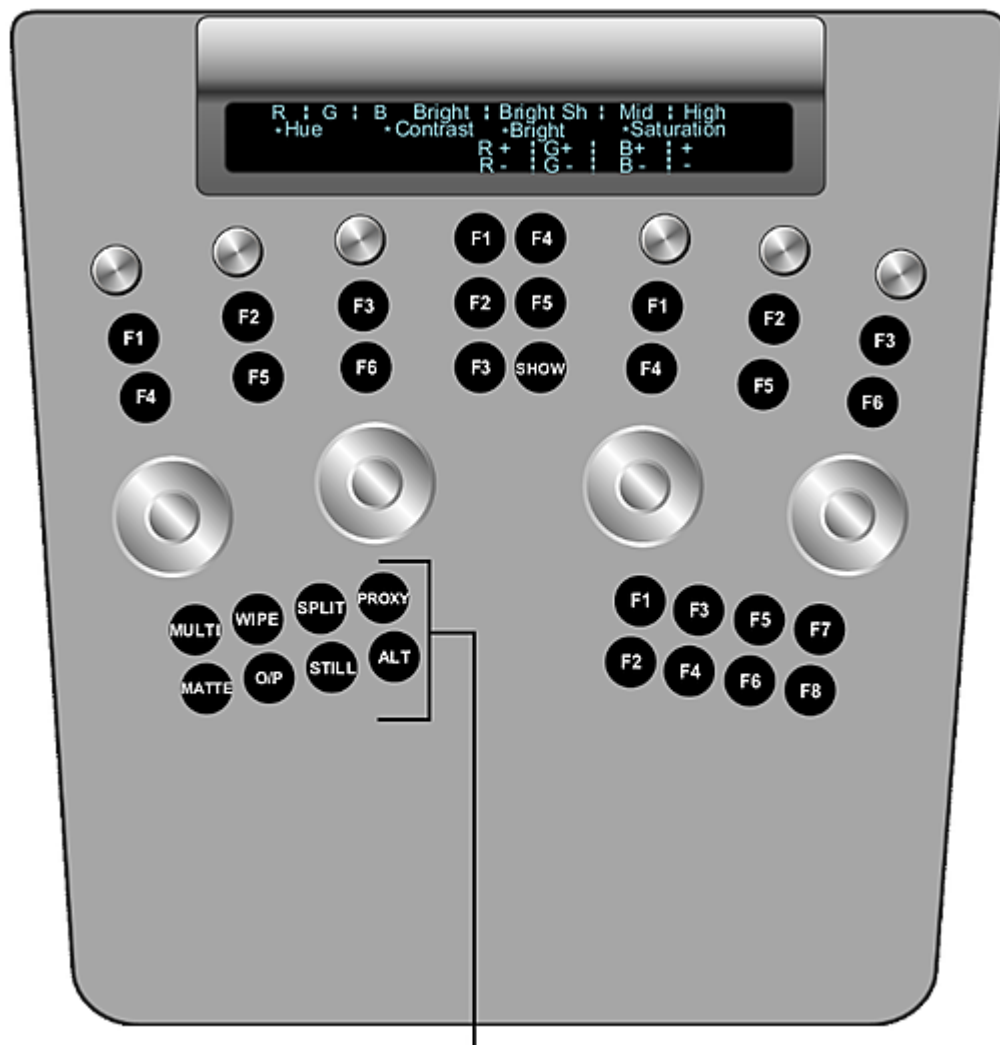
The View, Panel, Storyboard, Label, Thumbs, and GUI options appear in the digital display at the top of the panel. The location of each option in the digital display reflects their button position on the panel.

- 2 Select one of the following options.

Press:	To:
GRADE	Select the viewing options. Player Viewing Options (page 826).
CURVES	Adjust the panel sensitivity. See Customizing the Panel Sensitivity (page 823).
KEY	Toggle the Storyboard on or off.
GEOM	Toggle the shot name on or off the image.
P&S	Toggle the Storyboard thumbnails on or off.
MISC	Toggle the full-screen Player on or off.

To access view options available on the Function panel:

- 1 Use the viewport options to change the view as you work on your grades. For example, press PROXY to view a proxy version of your shot in the Player.



Viewport options

Viewport option	Description
MULTI	Cycles through the Multi view modes. You can view 2, 4, 9, or 16 shots within the Player.
WIPE	Cycles through the horizontal wipe, vertical wipe, and blend (for a stereoscopic project only).
SPLIT	Toggles between the current view options and the Single view (default).
PROXY	Toggles between the full-resolution and half-resolution (proxy) version of your shot in the Player. If you have not rendered a proxy, an X appears in the Player.
MATTE	Toggles between secondary grading view and result view.
O/P	Toggles between a rendered version of your shot (P) and the pre-rendered version with grading applied (O). If you have not rendered the shot, an X appears in the

Viewport option	Description
	Player when in P mode. Press the ALT and O/P buttons simultaneously to toggle to I mode (this displays the image with colour corrections made in the Grading and Curves menus only).
STILL	Displays the stored reference image. Press the ALT and Still buttons simultaneously to store the current frame in the reference buffer.

NOTE You can also access the SHOW button in the Function panel. This button shows or hides the geometry wireframe for the current secondary layer.

NOTE There is no functionality assigned to the Function panel's ALT button for this release.

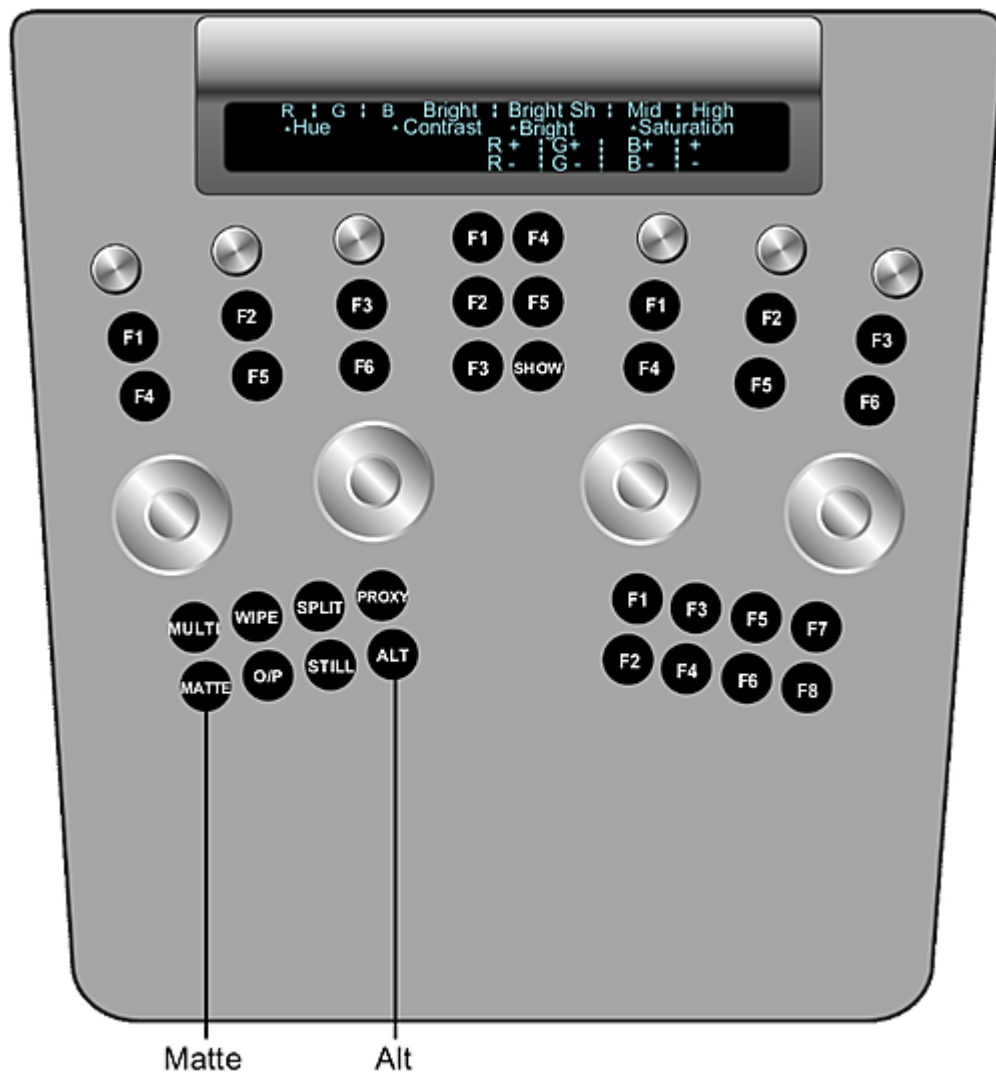
To change fonts in the digital display:

- 1 On the keyboard, press `Shift+F` until you obtain the desired font.

NOTE The change is only maintained for the current session.

To toggle between “O” view and Matte view:

- 1 Press the MATTE button on the Function panel.



- 2 Hold down the ALT button on the Function panel while pressing MATTE again to switch between Saturated Mask view and black and white Matte view.

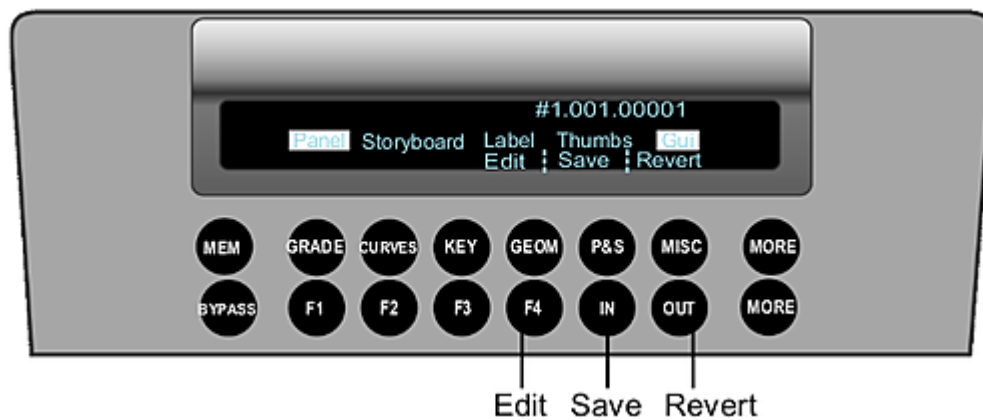
TIP You can go directly to Saturated Mask view mode from another mode, e.g. Output, by holding down the ALT button and pressing MATTE.

Customizing the Panel Sensitivity

When you enable the Edit function, you can modify the sensitivity of any modifier (e.g., knobs, wheels, and rings). These items include the Grading, Curves, Key, Geom, P&S, and Misc menu.

To edit the sensitivity of the Autodesk Control Surface panels:

- 1 On the Navigation panel, press the top MORE button.
- 2 Press the CURVES button to enter the Panel menu.



In the Panel menu you can Edit (F4 button), Save (IN button), and Revert (OUT button) your panel sensitivity changes.

- 3 Press the F4 button to enable the Edit mode.
- 4 Touch any modifier you want to change its sensitivity on the panel. Turn the modifier clockwise to increase the sensitivity or counter-clockwise to decrease the sensitivity.

NOTE The Function panel displays the Grade menu by default. To change the sensitivity of the Curves, Geometry, Keyer, or Reposition menu, you must enable the menu you want to modify first before entering the panel sensitivity option.

When a control is selected, its name and sensitivity are displayed on all the LCD panels. The last line of the LCD displays the control you are modifying, its value, and the enabled Edit mode.

NOTE Some control names are long and therefore are truncated on the Navigation panel LCD. The Function and Grading panels display the full name and value.

- 5 Press the F4 button again to disable the Edit mode. You can now test out the new sensitivity value.

NOTE Pressing F4 does not exit you from the Panel menu.

NOTE You need to save the rules file in order to commit your modification. If you do not save the modification, you will lose the modified value(s) when you quit Lustre.

Saving the Sensitivity Modifications

When you have completed making modifications to the sensitivity of your Autodesk control surface panel and tested the sensitivity, you must save your changes.

To save the modifications to your Autodesk Control Surface panel:

- 1 Press the IN button. The Save option is selected and the LCD displays “Confirm Save”.
NOTE If you do not want to confirm the save, press the F1 button to exit the Save menu. The display returns to the Panel menu.
- 2 Press the IN button again. The LCD displays “Saving Panel File”.
The changes are saved and the display returns to the top level menu.

Reverting the Panel Modifications

If you have made modifications to the panel control values and have not saved the changes, you can revert back to the previous saved values.

To revert the saved panel modifications:

- 1 Press the OUT button to select the Revert option.

The LCD displays “Confirm Revert”.

NOTE If you do not want to confirm the revert, press the F1 button to cancel the revert. The display returns to the Panel menu.

- 2 Press the OUT button again to confirm the revert. The LCD displays “Reverting Panel File” and then returns to the top level menu.

Selective Backlighting of Active and Available Buttons

In order to make it easier to determine which functions are currently available on the Autodesk control surface panels, you can select Mid from amongst the options accessible from the Navigation panel.

The Mid option highlights active buttons and available buttons.

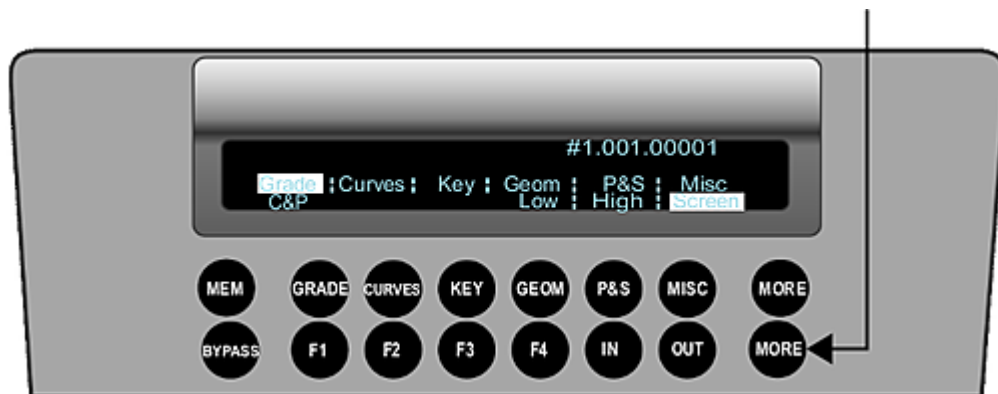
An active button is one that has been enabled by the user. For example, if you enable secondary two for Inside grading, the 2 button on the numeric keypad and the Inside button are backlit on the Navigation panel.

An available button is one that has been enabled by the system based on a feature that you selected. For example, if you switch from the Geom menu to the Reposition menu, the backlighting on the Function panel changes to show which buttons are available for performing repositioning tasks.

To enable backlighting for active and available buttons:

- 1 Press the bottom MORE button on the Navigation panel.

The Low, Mid, High, and Screen options appear in the digital display.



- 2 Press the F4 button.

Active and available buttons are now backlit.

NOTE The Low option is now accessible by pressing the F3 button.

Toggling Playheads

reference images:toggling playheads with the Autodesk control surfaceplayheads:toggling with the Autodesk control surfaceYou can toggle between the images assigned to Playhead A and B.

To toggle playheads:

- 1 Press the A/B button on the Navigation panel.

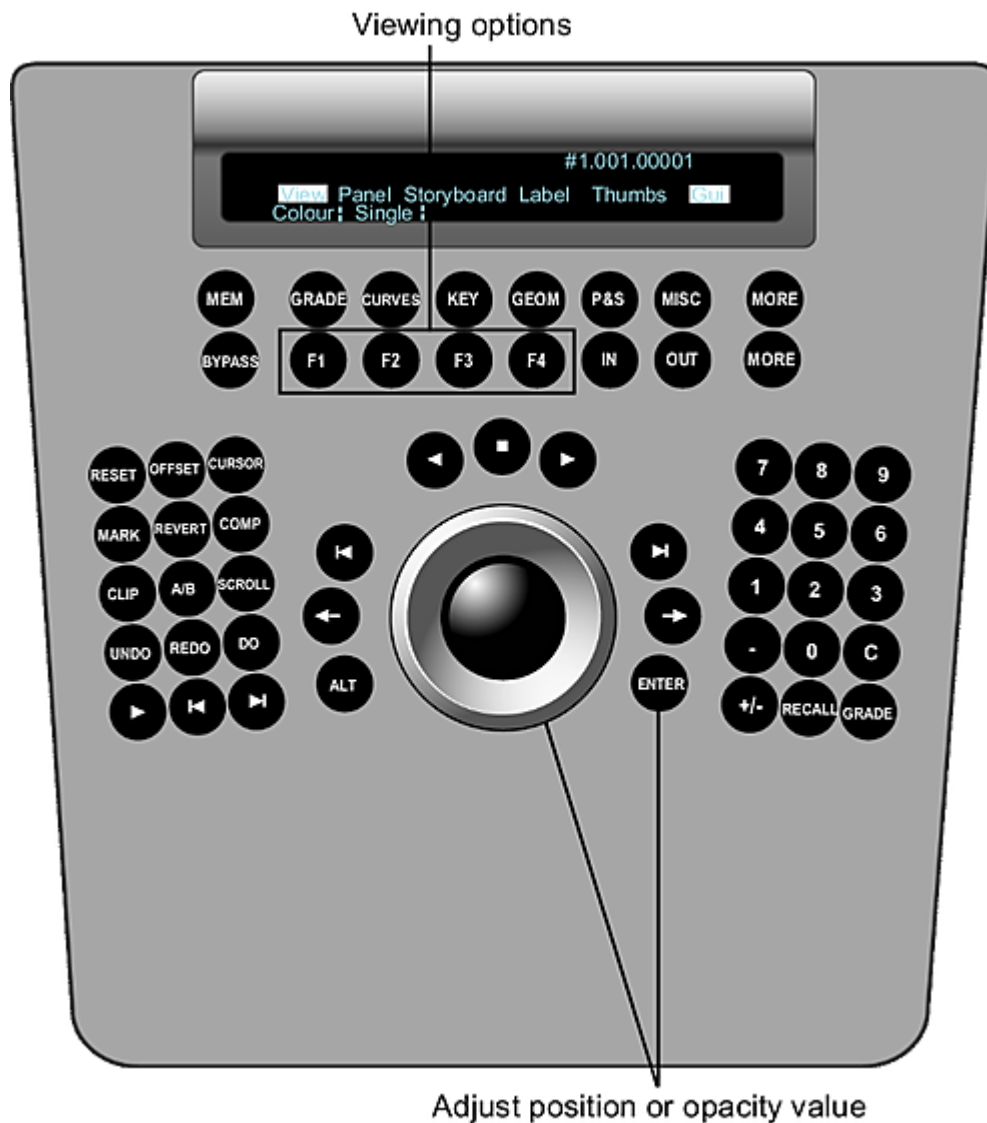


Player Viewing Options

There are several ways you can view the shots within the Player. You can choose to display the shot(s) in a Single, Dual, or Multi view. These viewing options are accessible through the Navigation panel.

To access the viewing options:

- 1 Press the top MORE button on the Navigation panel.
- 2 Press GRADE to access the viewing options.
- 3 Use the following controls.



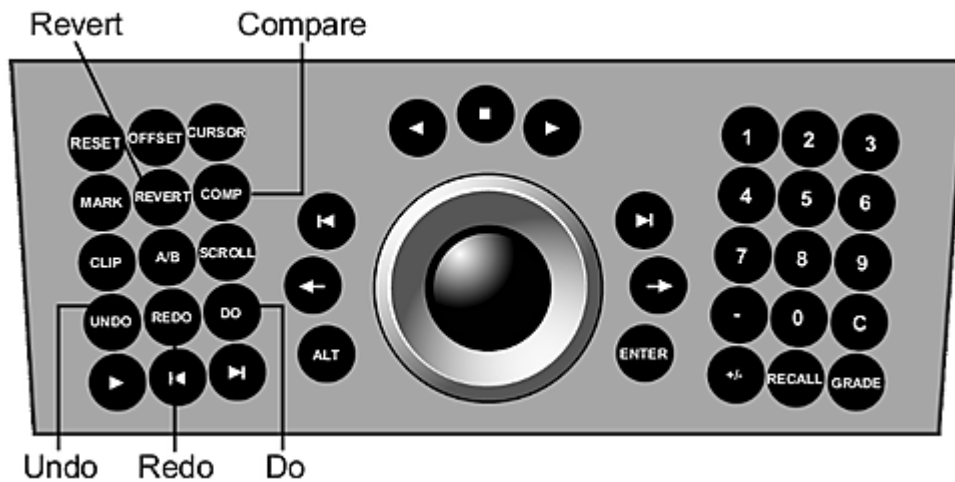
Press:	To:
F1	Cycle through the different colour view selections (i.e., colour, red, green, blue, and luminance channels).
F2	Cycle through the different viewers (i.e., Single, Dual, or Multi view).
F3	Toggle between Playheads A and B (A/B) or Left Eye and Right Eye (L/R). This is only applicable for Dual view.
F4	Cycle through the Dual view modes (i.e., 2-up, horizontal wipe, vertical wipe, or blend). Blend is only available if you have L/R selected. Cycle through the Multi view modes (i.e., 2-up, 4-up, 9-up, or 16-up).

NOTE To revert to the previous selection, press ALT on the Navigation panel and the corresponding F1, F2, F3, or F4 button.

- (Optional) If you have selected a wipe or blend, you can adjust the position of the wipe or the opacity of the blend by holding ENTER on the Navigation panel and rotating the ring portion of the trackball.

Using the Undo List

redoing:with the Autodesk control surfaceundoing:with the Autodesk control surfaceYou can access the undo list from the Navigation panel. The undo list works differently than it does in the user interface. When you use the panel, you must save your changes to the undo list using the Do button. Undo lists are saved on a shot-by-shot basis.



To save a change to the undo list:

- 1 Press the DO button.

To go through the undo list:

- 1 Press the UNDO or REDO button.

Reverting to Previous Grades

reverting to previous:grades with the Autodesk control surfacegrades:reverting to previous with the Autodesk control surfaceYou can use the Navigation panel to toggle between the grade that was applied to a shot when you first selected it in the Storyboard and the current grade.

To revert to previous grades:

- 1 Press the REVERT button on the Navigation panel.

To save the reverted stage to the undo list:

- 1 Press the DO button on the Navigation panel.

Comparing Grades

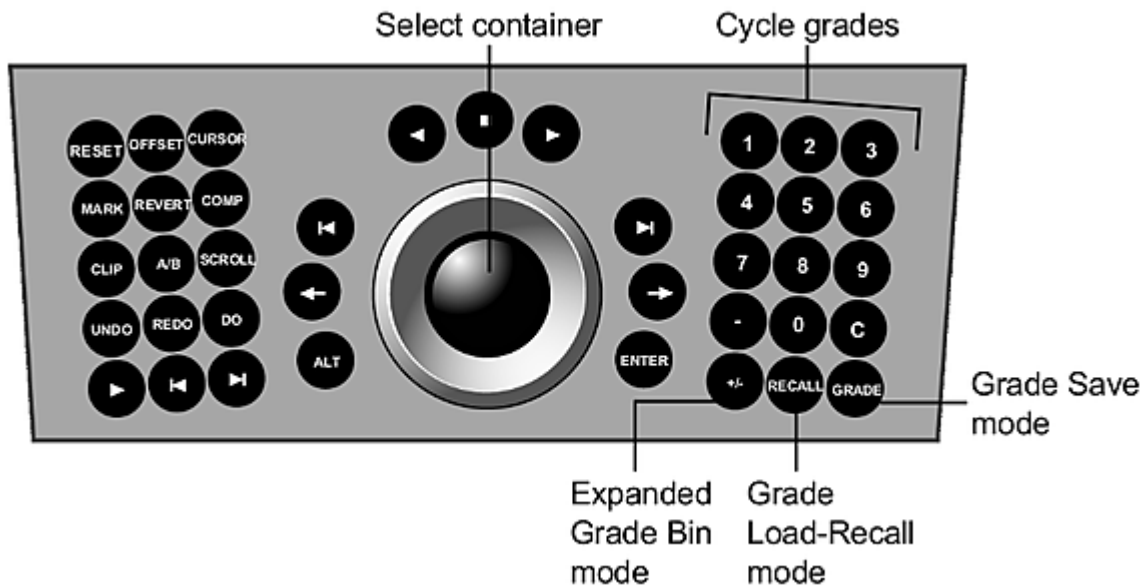
comparing:grades with the Autodesk control surfacegrades:comparing with the Autodesk control surfaceYou can compare the current image with the grade you last committed to the undo list.

To toggle between the current image and the grade you last committed to the undo list:

- 1 Press the COMP button on the Navigation panel.

Working with the Grade Bin

grades:applying from the Grade binGrade bins:accessing with the Autodesk control surfaceYou can use the Navigation panel to access Grade bin functionality.



Saving a Grade to the Grade Bin

Use Grade Save mode to save one or more grades to the Grade bin.

To save a grade to the Grade bin:

- 1 On the Storyboard, use the ring to navigate to the shot with the grade you want to save.
TIP This step can also be performed after you enter Grade Save mode.
- 2 Press the Grade button on the Navigation panel.
This activates Grade Save mode.
- 3 To select a storage container in the Grade bin, do one of the following:
 - Use the jog ball on the trackball.
 - Press the keypad number button that corresponds to the desired Grade bin container position.
- 4 To save the shot's grade to the storage container, double-press the keypad number button that corresponds to the desired Grade bin container.

After the grade is saved, you are still in Grade Save mode and can save other grades. Use the trackball ring to navigate to other shots.

- 5 To exit Grade Save mode, press Grade.

Loading a Grade From the Grade Bin

Use Grade Load-Recall mode to load grades from the Grade bin to one or more shots on the Storyboard.

To load a grade from the Grade bin:

- 1 On the Storyboard, navigate to the shot to which you want to load one or more grades.
TIP This step can also be performed after you enter Grade Load-Recall mode.
- 2 Press the Recall button on the Navigation panel.
This activates Grade Load-Recall mode.
- 3 To select a grade in the Grade bin, do one of the following:
 - Use the jog ball on the trackball to navigate the Grade bin.
 - Press the keypad number button corresponding to the desired Grade bin container position once to jump to it.
- 4 To load the grade to the current selected shot on the Storyboard, double-press the appropriate number button twice.
After the grade is loaded to the shot, you are still in Grade Load-Recall mode and can load other grades from the Grade bin to the shot. Use the trackball ring to navigate to other shots.
- 5 To exit Grade Load-Recall mode, press Recall.

Saving the Current Grade

You can use the Navigation panel to save the current grade file and cut.

NOTE If a grade file has not been created, a default grade file is saved.

To save the current grade file and cut:

- 1 Press ALT and DO on the Navigation panel.

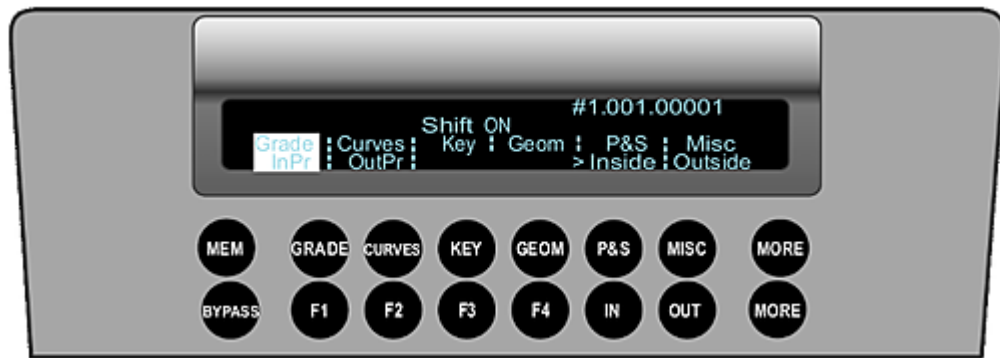
Adjusting Printer Lights

You can adjust printer lights on the Navigation panel. Printer light values are displayed in the Colour Grading panel's digital display.

NOTE You can also adjust printer lights on the Function panel when the Grade menu is enabled. See [Grading in Logarithmic Mode Using the Function Panel](#) (page 843).

To adjust printer lights:

- 1 On the Navigation panel, double-press the ALT button.
The words "Shift ON" appear in the digital display.



- 2 Use the following buttons on the keypad to make printer light adjustments to the image.

Press:	To:
7	Increase red brightness by one step.
4	Decrease red brightness by one step.
8	Increase green brightness by one step.
5	Decrease green brightness by one step.
9	Increase blue brightness by one step.
6	Decrease blue brightness by one step.
1	Increase cyan brightness by one step.
- (minus sign)	Decrease cyan brightness by one step.
2	Increase magenta brightness by one step.
0	Decrease magenta brightness by one step.
3	Increase yellow brightness by one step.
. (period)	Decrease yellow brightness by one step.

Copying Grades

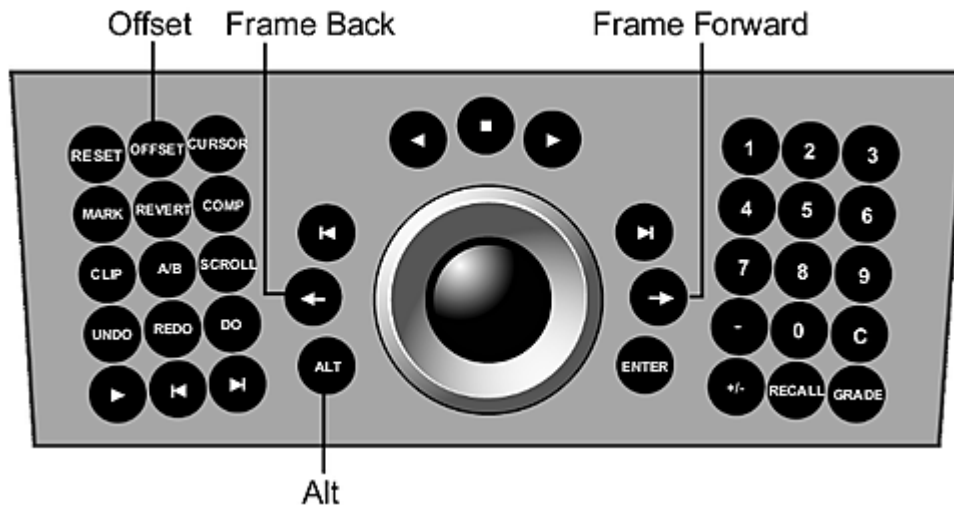
copying:grades with the Autodesk control surfacegrades:copying with the Autodesk control surfaceYou can temporarily or permanently copy a grade to the current shot from another shot in the Storyboard.

To copy a grade to the current shot from another shot in the Storyboard:

- 1 Scroll to the shot you would like to copy grades to by performing one of the following two actions:
 - Hold down the ALT button on the Navigation panel and then press the Frame Forward or Frame Back button to temporarily apply the grade from the previous or next shot to the current shot.

NOTE Each time you press ALT and Frame Forward or Frame Back, you move one shot at a time through possible sources to copy back to the current Storyboard position. For example, if you hold down ALT and press Frame Forward three times, you see a preview of the current Storyboard position with the grade from three shots ahead applied.

- Press Offset on the Navigation panel and then scroll through the shots by pressing the Scroll button and using the ring portion of the trackball.



- 2 Press Do to permanently copy the grade from the shot outlined in blue to the current shot.
- 3 Press the ALT button to cancel the operation.

Adding Keyframes

When you animate parameters, you can set keyframes using the Mark button.

To add keyframes:

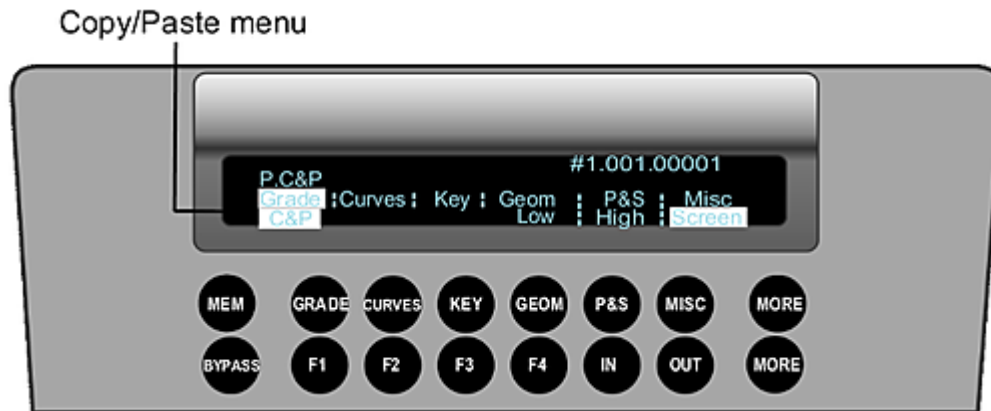
- 1 Go to the frame where you want to add the keyframe.
- 2 Press Mark.
- 3 Modify the parameters.
- 4 Repeat the above steps as required.

Copying and Pasting Keyframes

You can copy and paste keyframes using the Navigation and Function panels of the Autodesk control surface panel.

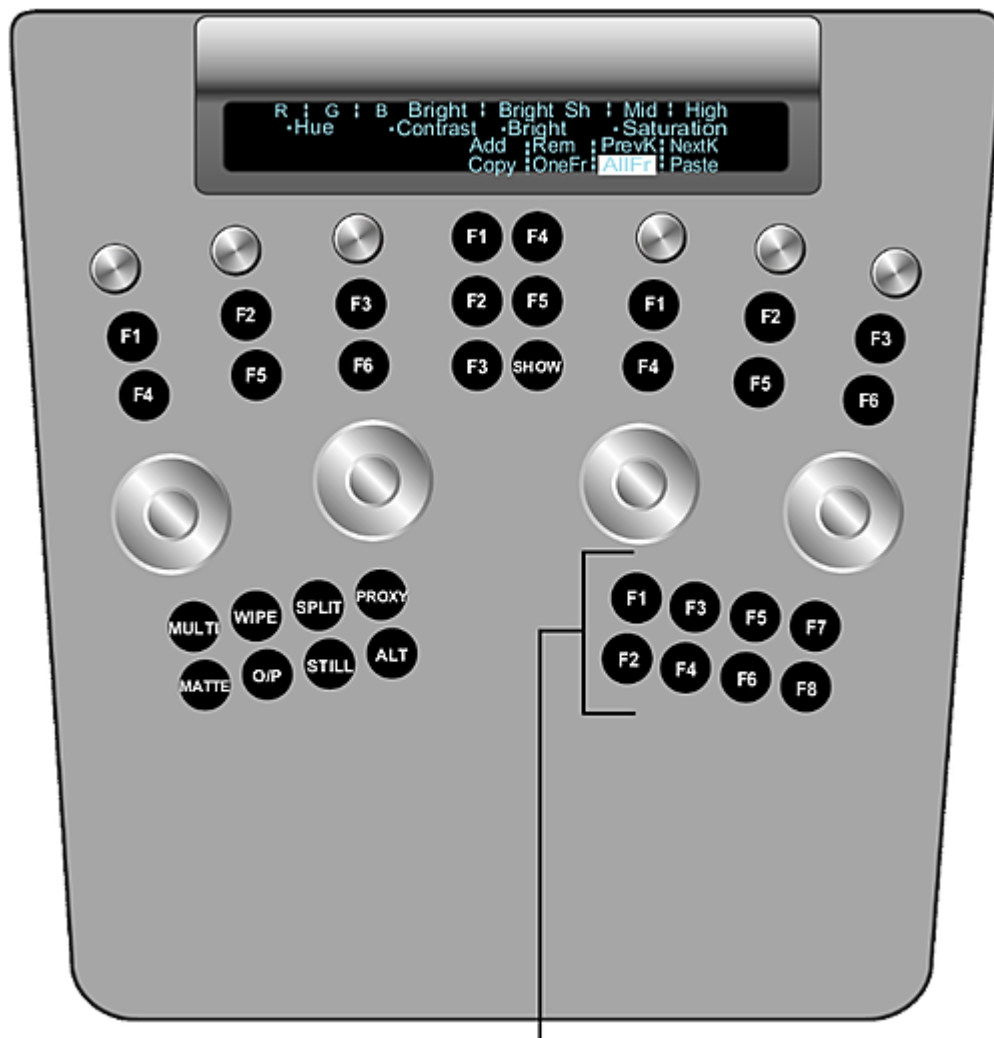
To copy and paste keyframes:

- 1 On the Navigation panel, press the bottom MORE button.
- 2 Press the F1 button to enable the P. C & P menu.
The Permanent Copy/Paste (P. C & P) menu is displayed.



- 3 On the Function panel, press the appropriate button (F1-F8) to perform your choice of copy and paste operation.

NOTE When you press one of these buttons, the corresponding button is automatically pressed in the Channel hierarchy and the corresponding menu command is highlighted in the Function panel display. For example, when you press F1 to add a keyframe, the Add button is pressed and the Add command is highlighted.



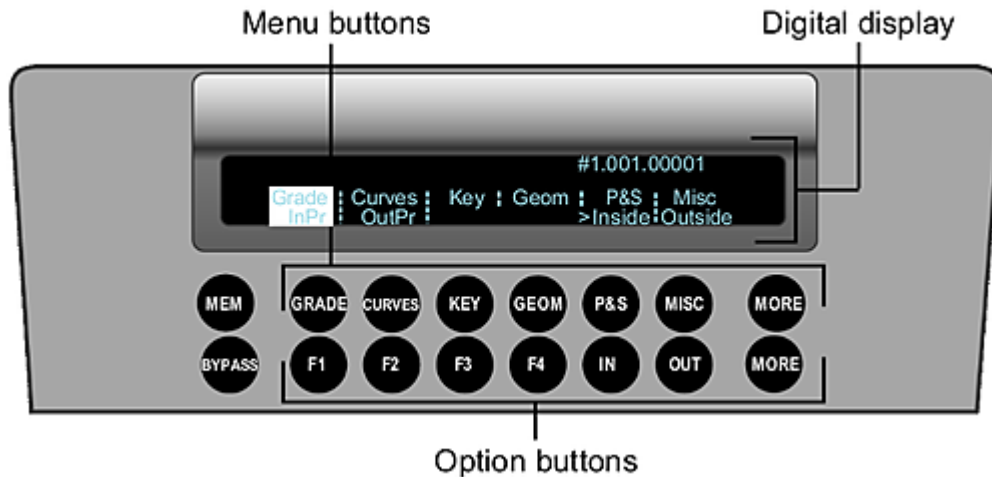
Copy/Paste Keyframe functions

Copy/Paste Keyframe option	Function
F1	Add keyframe
F2	Copy
F3	Remove keyframe
F4	One frame
F5	Next keyframe
F6	All frames
F7	Previous keyframe

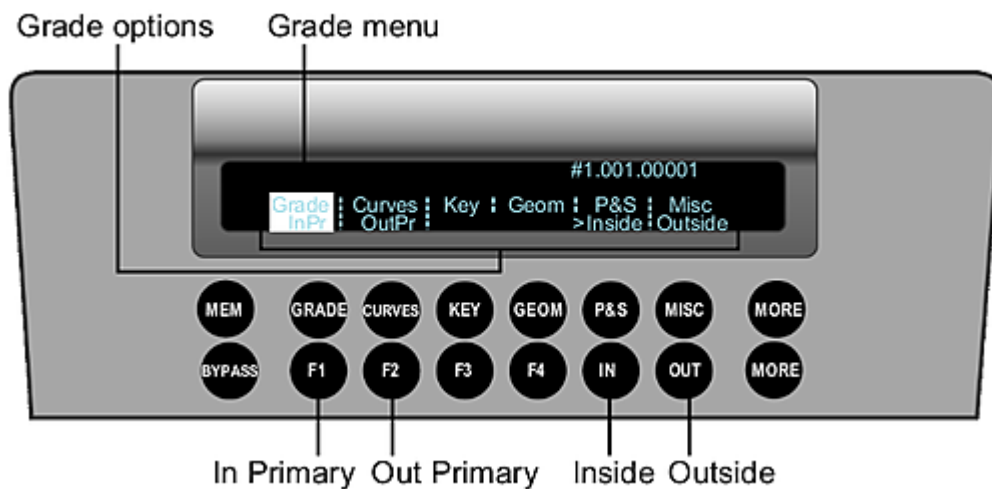
Copy/Paste Keyframe option	Function
F8	Paste

Selecting Menus

Selecting a menu from the first row of buttons on the Navigation panel determines which options are available in the second row of buttons. What you select in the Navigation panel also determines the features available on the Function panel.



You can see which options are available by checking the digital display. For example, in the following illustration the Grade menu has been selected and the InPr, OutPr, Inside, and Outside options appear in the digital display. The location of these options in the digital display is the same as their location amongst the option buttons.



To select a menu:

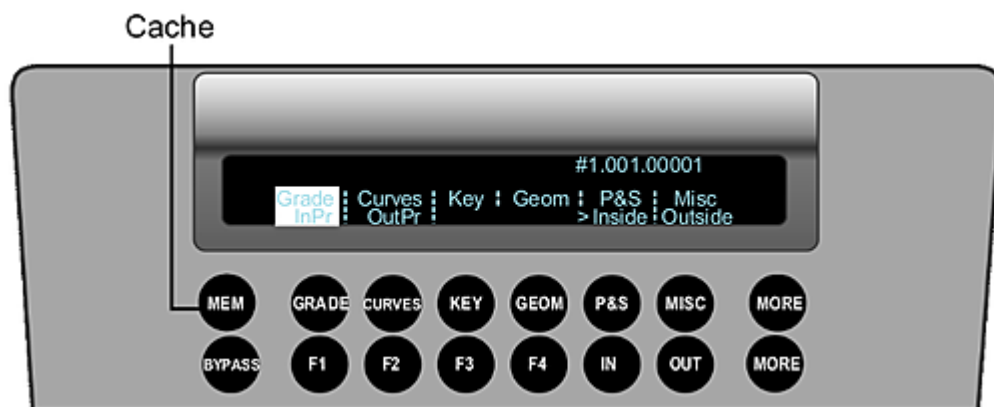
- 1 Choose one of the following.

Press:	To:
Grade	Enable the In Primary, Out Primary, Inside, and Outside options, and activate Logarithmic or Linear grading in the Function panel. See Performing Colour Grading (page 840).
Curves	Enable the In Primary, Out Primary, Hue, and RGB options, and activate curves grading in the Function panel. See Performing Curves Grading (page 851).
Key	Enable the Key menu, and activate keying functionality in the Function panel. See Extracting Keys using the HLS Keyer (page 856) and Extracting Keys using the Diamond Keyer (page 861).
Geom	Enable the Rectangle, Circle, Wipe (in Dual view), Bezier (free-form geometry), Inside, and Outside options, and activate geometry grading in the Function panel. See Creating and Grading Geometries (page 866).
P&S	Activate repositioning functionality in the Function panel. When this function is selected, no additional options are activated in the Navigation panel. See Repositioning Shots (page 838).
More (upper)	Access the following additional options: Label, Thumbnails, and GUI. These options pertain to elements in the user interface. See Customizing the View (page 819).
More (lower)	Access the following additional options: Low, High, and Screen. These options pertain to the control surface appearance. See Modifying the Appearance of the Autodesk Control Surface (page 872).

NOTE There is no functionality assigned to the Misc button for this release.

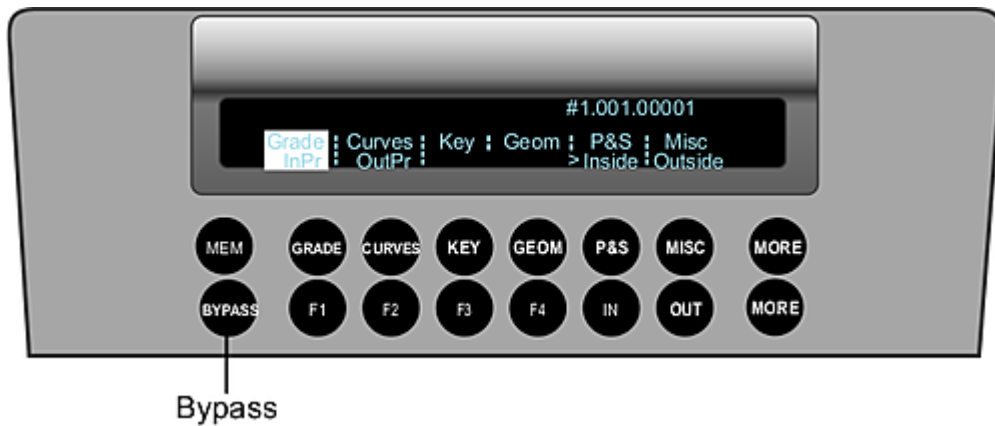
Caching Memory

When a shot does not play back in real time, you can cache the frames into memory using the Mem button.



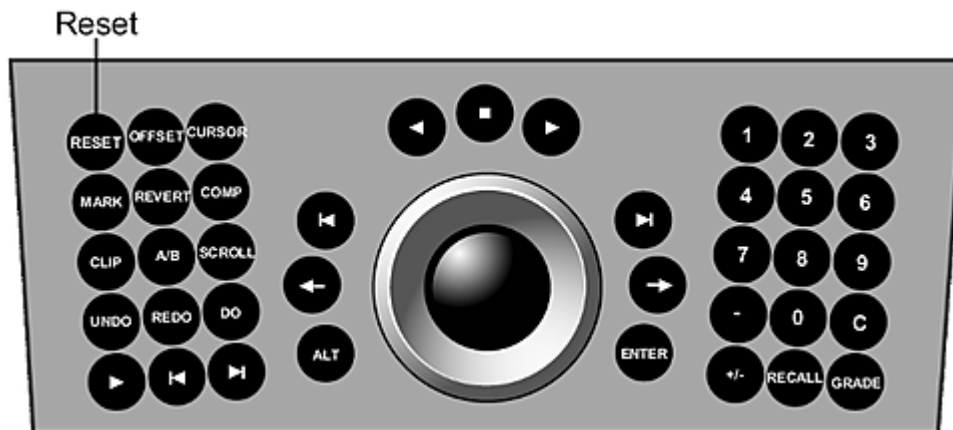
Bypassing Functions

menus:menus with the Autodesk control surface
menus:bypassing with the Autodesk control surface
Use the Bypass button on the Navigation panel to bypass the currently selected menu.



Resetting Functions

menus:resetting with the Autodesk control surface
resetting:with the Autodesk control surface
Use the Reset button on the Navigation panel to reset parameters for the current menu only, or to reset all parameters on the currently selected shot.



To reset parameters for the current menu only:

- 1 Press the Reset button once.

To reset all parameters on the shot:

- 1 Double-press the Reset button.

TIP You can reset individual parameters by pressing its assigned Reset button. These buttons are indicated throughout this chapter.

Repositioning Shots

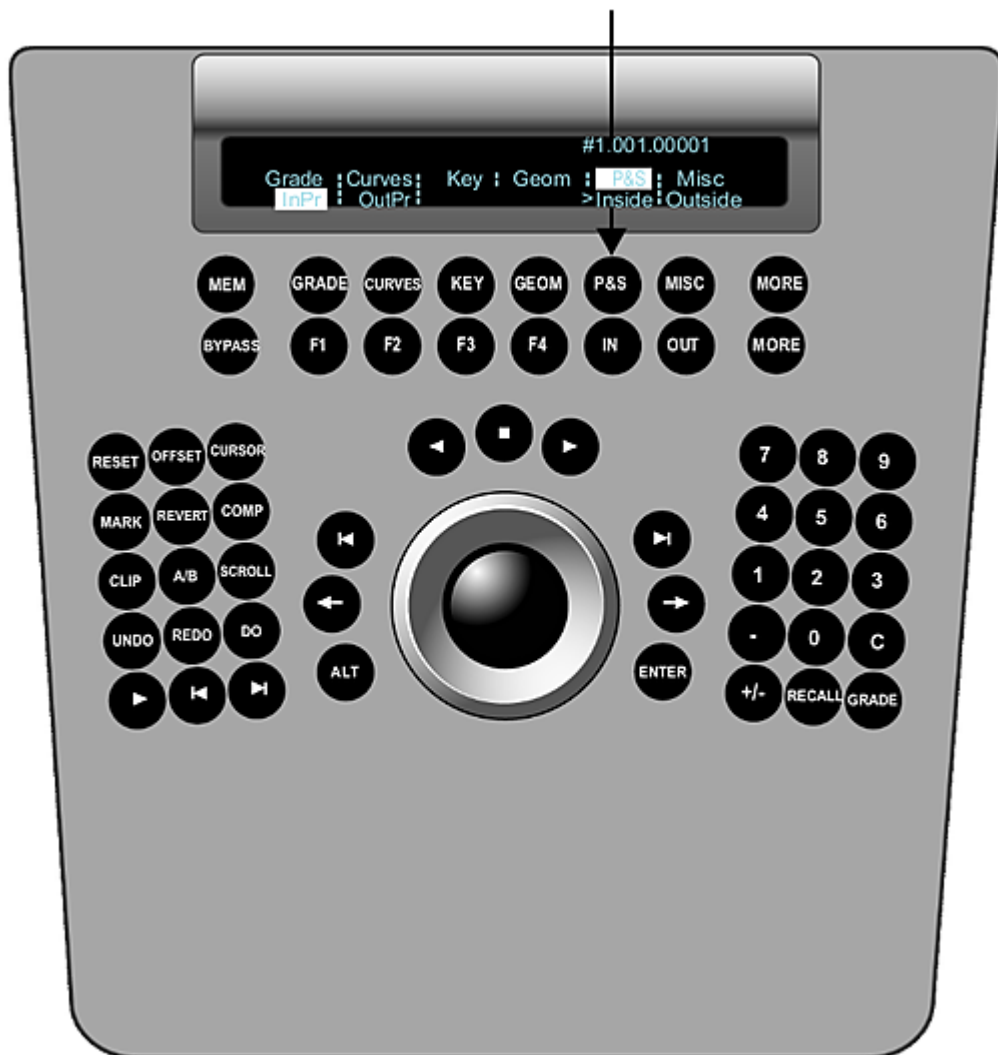
shots:repositioning with the Autodesk control surfacerepositioning:shots with the Autodesk control surfaceYou can reposition a shot by:

- Scaling
- Panning vertically and horizontally
- Rotating
- Changing the aspect ratio
- Flipping and flopping

When Sync mode is enabled in a stereoscopic project, you can use the Convergence tool to pan and scale both eyes at the same time in opposite directions.

To reposition a shot:

- 1 Press the P&S button on the Navigation panel.



- 2 On the Function panel, use the following controls.

Performing Colour Grading

colour grading:primaries with the Autodesk control surfaceYou can use the Autodesk control surface to perform input and output grading in Logarithmic or Linear mode.

As with other menus, you select the Grade menu from the Navigation panel. This activates colour grading functionality on the Function panel. The Colour Grading panel is enabled regardless of which menu is active in the Function panel. The features available on these panels depend on whether you are in Logarithmic or Linear mode. You specify the colour architecture in the Setup Grade menu in the user interface.

Logarithmic Mode

Logarithmic mode:grading with the Autodesk control surfaceprimary colour grading:in Logarithmic mode with the Autodesk control surfaceWhen Log is enabled in the Setup Grade menu, the Colour Grading panel and the Function panel are activated with logarithmic colour grading functionality.

Grading in Logarithmic Mode Using the Colour Grading Panel

Use the Colour Grading panel to:

- Adjust brightness balance and contrast balance for the entire image or for a range of colours.
- Adjust brightness in the shadows, midtones, and highlights.

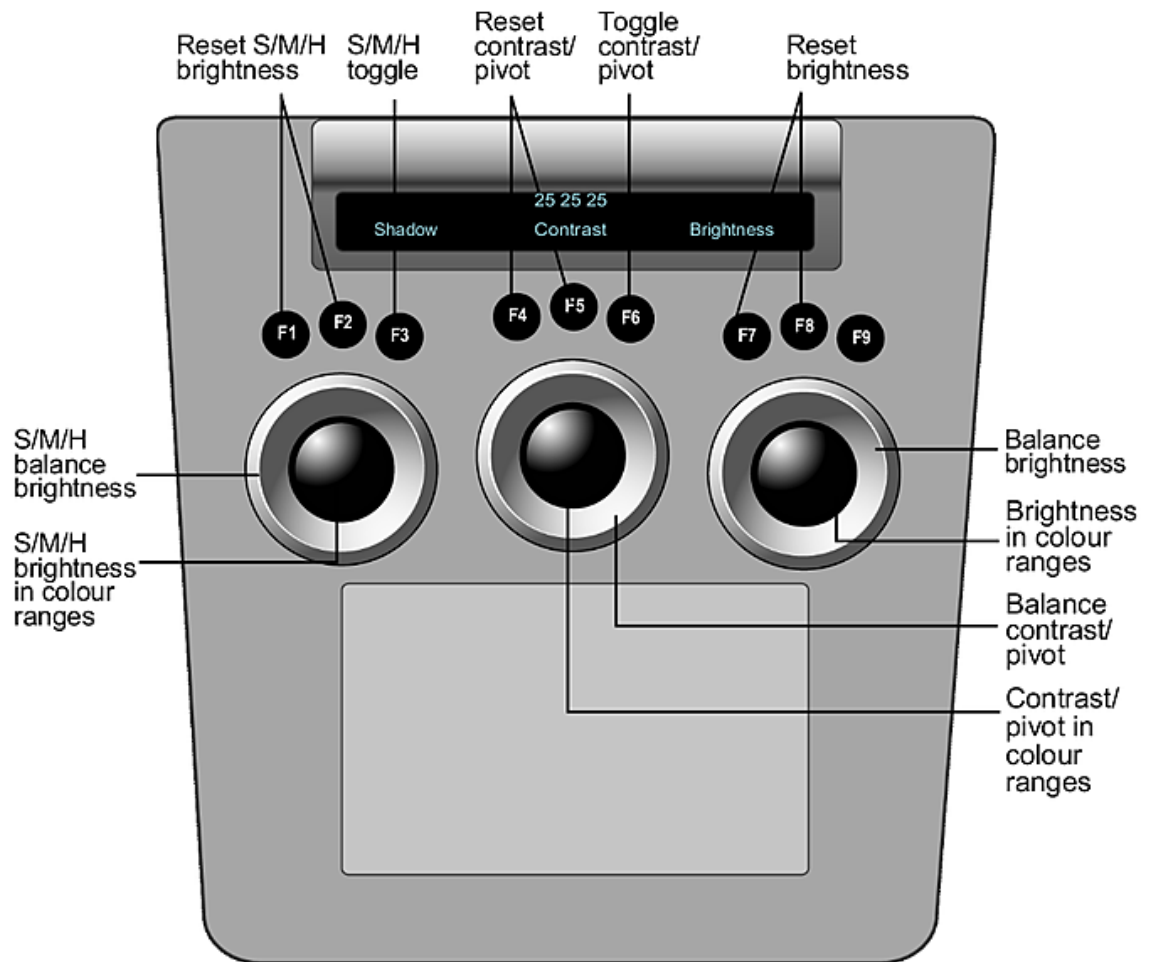
There are two available setups for the Colour Grading panel. You can switch between setups by pressing the F9 button.

The default setup allows you to modify contrast, overall brightness, and brightness in the shadows, midtones, and highlights. Adjusting brightness in the shadows, midtones, and highlights requires that you switch the functionality of the first trackball among the three. You use the second and third trackballs to adjust contrast and brightness in the overall image.

The alternate setup distributes brightness controls for the shadows, midtones, and highlights amongst the three trackballs. This allows you to balance the values without having to constantly switch the functionality of a single trackball.

To colour grade using the Colour Grading panel default setup:

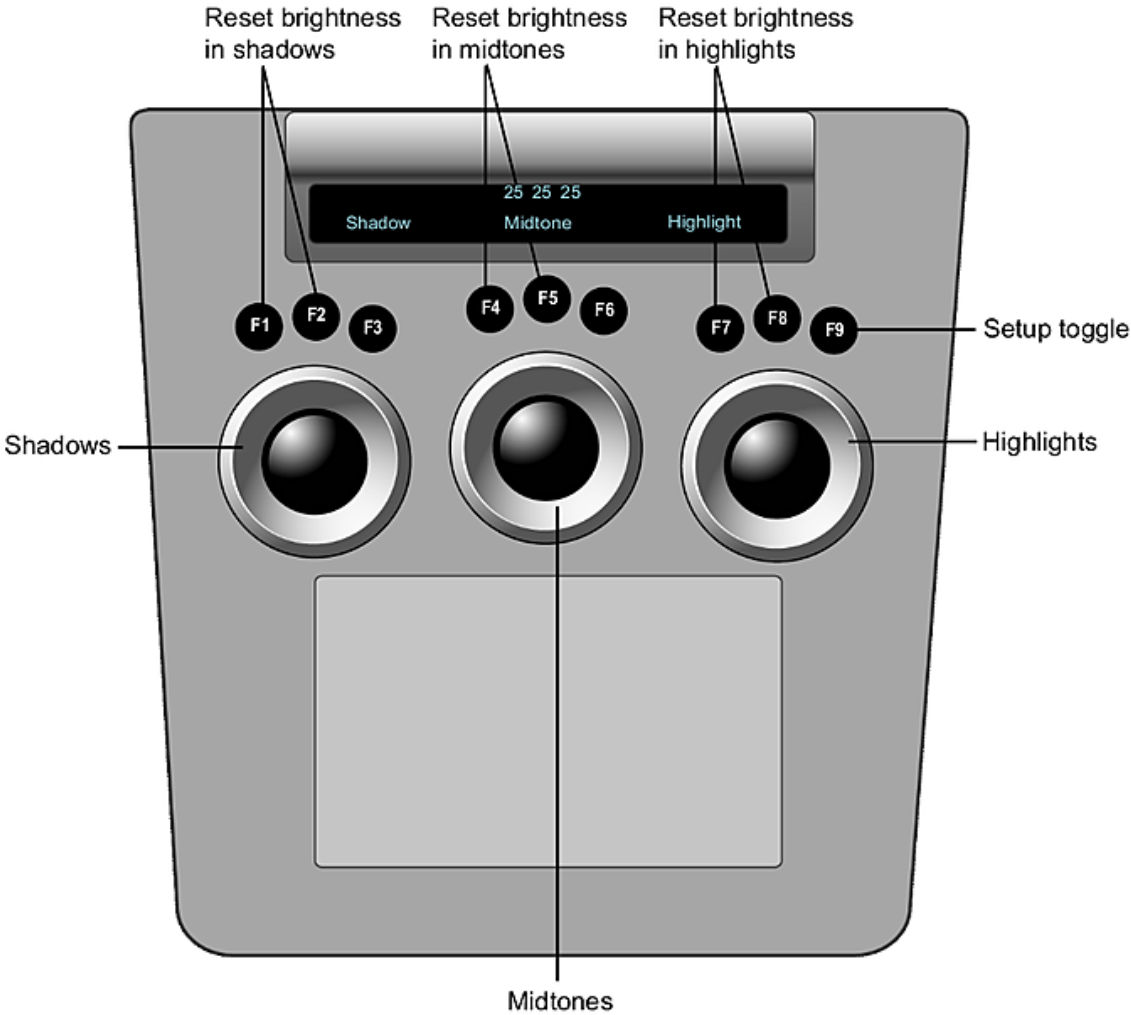
- 1 On the Colour Grading panel, use the following controls.



Use:	To:
First ring	Adjust brightness in the shadows, midtones, or highlights for the overall image. To reset, press F1.
First jog ball	Adjust brightness in the shadows, midtones, or highlights for a range of colours. To reset, press F2.
F3 button	Switch functionality for the first trackball between shadows, midtones, or highlights.
Second ring	Adjust contrast/pivot in the overall image. To reset, press F4.
Second jog ball	Adjust contrast/pivot in a range of colours. To reset, press F5.
F6 button	Toggle functionality for the second trackball between contrast and pivot.
Third ring	Adjust brightness in the overall image. To reset, press F7.
Third jog ball	Adjust brightness in a range of colours. To reset, press F8.

To colour grade using the Colour Grading panel alternate setup:

- 1 Press the F9 button to switch to the alternate setup.
- 2 On the Colour Grading panel, use the following controls.



Use:	To:
First ring	Adjust overall brightness in the shadows. To reset, press F1.
First jog ball	Adjust brightness in the shadows for a range of colours. To reset, press F2.
Second ring	Adjust overall brightness in the midtones. To reset, press F4.
Second jog ball	Adjust brightness in the midtones for a range of colours. To reset, press F5.
Third ring	Adjust overall brightness in the highlights. To reset, press F7.
Third jog ball	Adjust brightness in the highlights for a range of colours. To reset, press F8.

Use:	To:
F9 button	Toggle between the panel default and alternate setup.

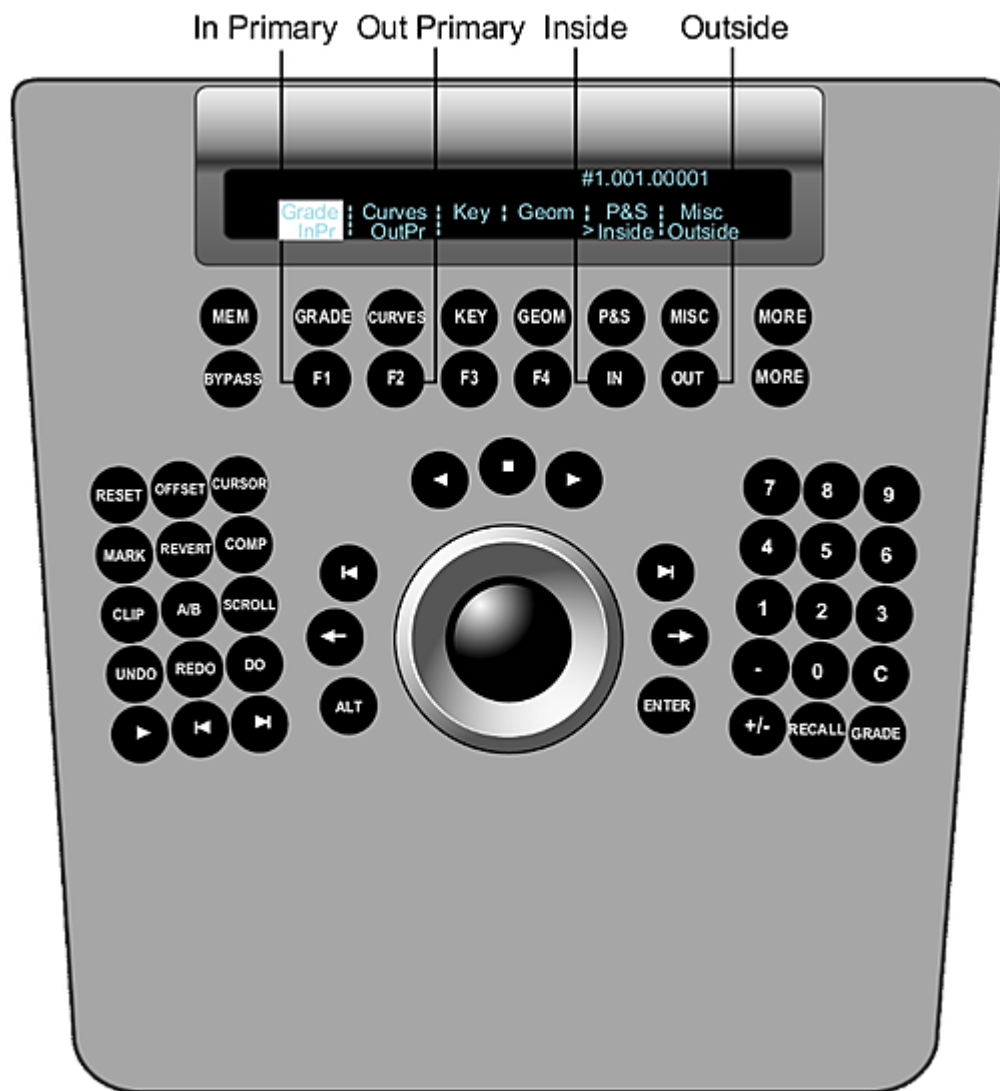
Grading in Logarithmic Mode Using the Function Panel

When the Grade menu is enabled, you can use the Function panel to:

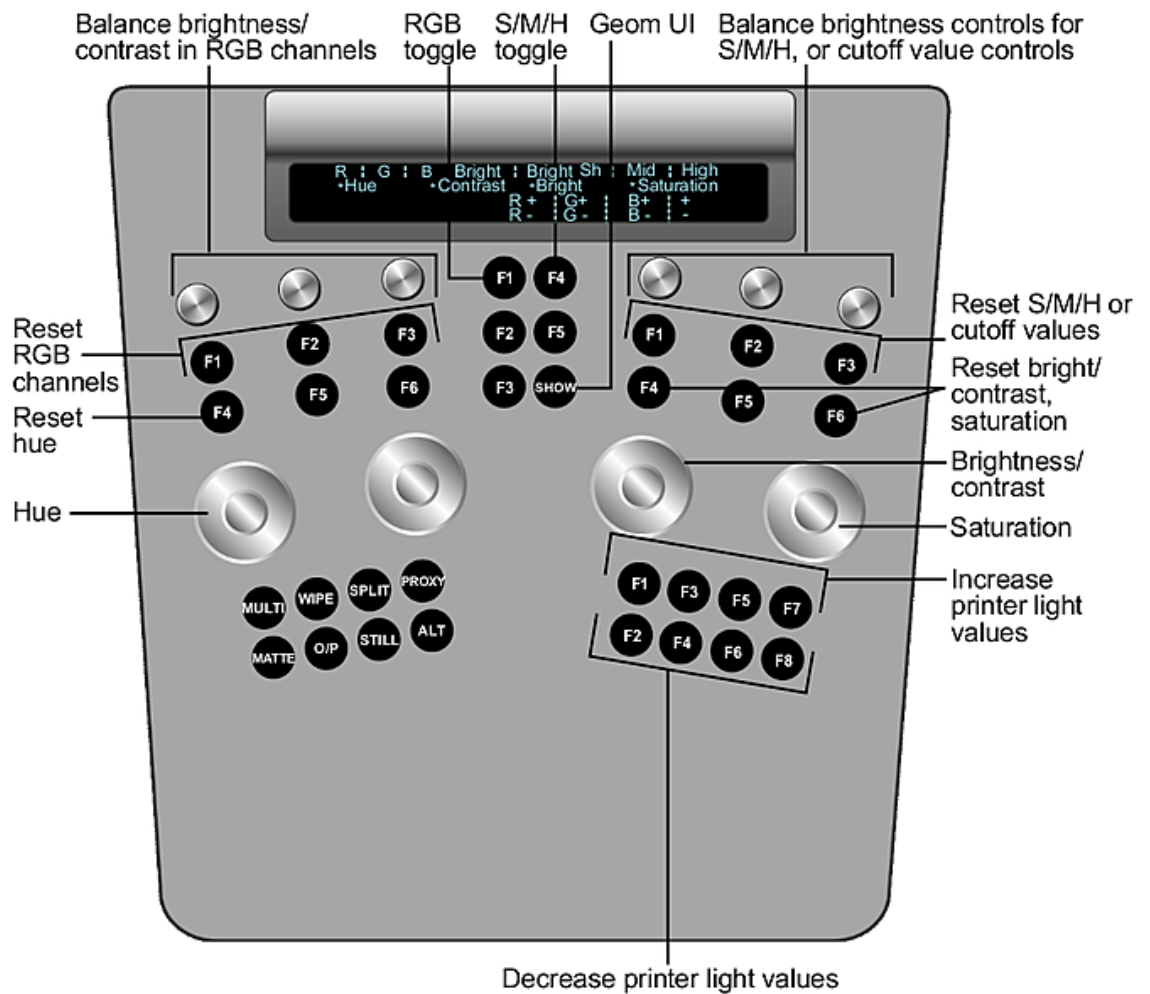
- Adjust overall hue, brightness, and saturation.
- Balance brightness and contrast in the red, green, and blue channels.
- Balance brightness of colours in the shadows, midtones, and highlights.
- Adjust cutoff values.
- Increase or decrease printer light settings.

To colour grade in Logarithmic mode using the Function panel:

- 1 Press the Grade button on the Navigation panel.
The In Primary, Out Primary, Inside, and Outside options are activated.



- 2 Do one of the following:
 - Press the F1 option button to work on the initial primary grade.
 - Press the F2 option button to work on final curve modifications.
 - If you are colour grading a secondary, either a key or a geometry, use the numeric keys on the Navigation panel to select and activate a secondary layer. See [Adding Secondary Layers](#) (page 854).
- 3 If you are accessing the Grade menu after having created a geometry or key, do one of the following:
 - Press the IN option button to grade inside the secondary.
 - Press the OUT option button to grade outside the secondary.
- 4 On the Function panel, use the following controls.



Use:	To:
Wheels	Modify overall hue, brightness/contrast, and saturation. Wheel 1=Hue Wheel 3=Brightness/contrast Wheel 4=Saturation To reset a wheel, press the button above it.
Knobs at top left	Balance brightness or contrast in the RGB channels. Knob 1=Red brightness/contrast Knob 2=Green brightness/contrast Knob 3=Blue brightness/contrast To toggle knob functionality, press the F1 button in the centre column. To reset a channel, press the button below it.
Knobs at top right	Balance S/M/H brightness of the colours, or adjust cutoff values. Knob 4=Brightness in shadows/cutoff values Knob 5=Brightness in midtones/cutoff values Knob 6=Brightness in highlights To toggle knob functionality, press the F4 button in the centre column. To reset a knob, press the button below it.

Use:	To:
First row of buttons at bottom right	Increase printer light values. F1=Red F3=Blue F5=Green F7=Overall
Second row of buttons at bottom right	Decrease printer light values. F2=Red F4=Blue F6=Green F8=Overall Press ALT for half point adjustments.
SHOW button	Toggle the geometry wireframe on or off.

Linear Mode

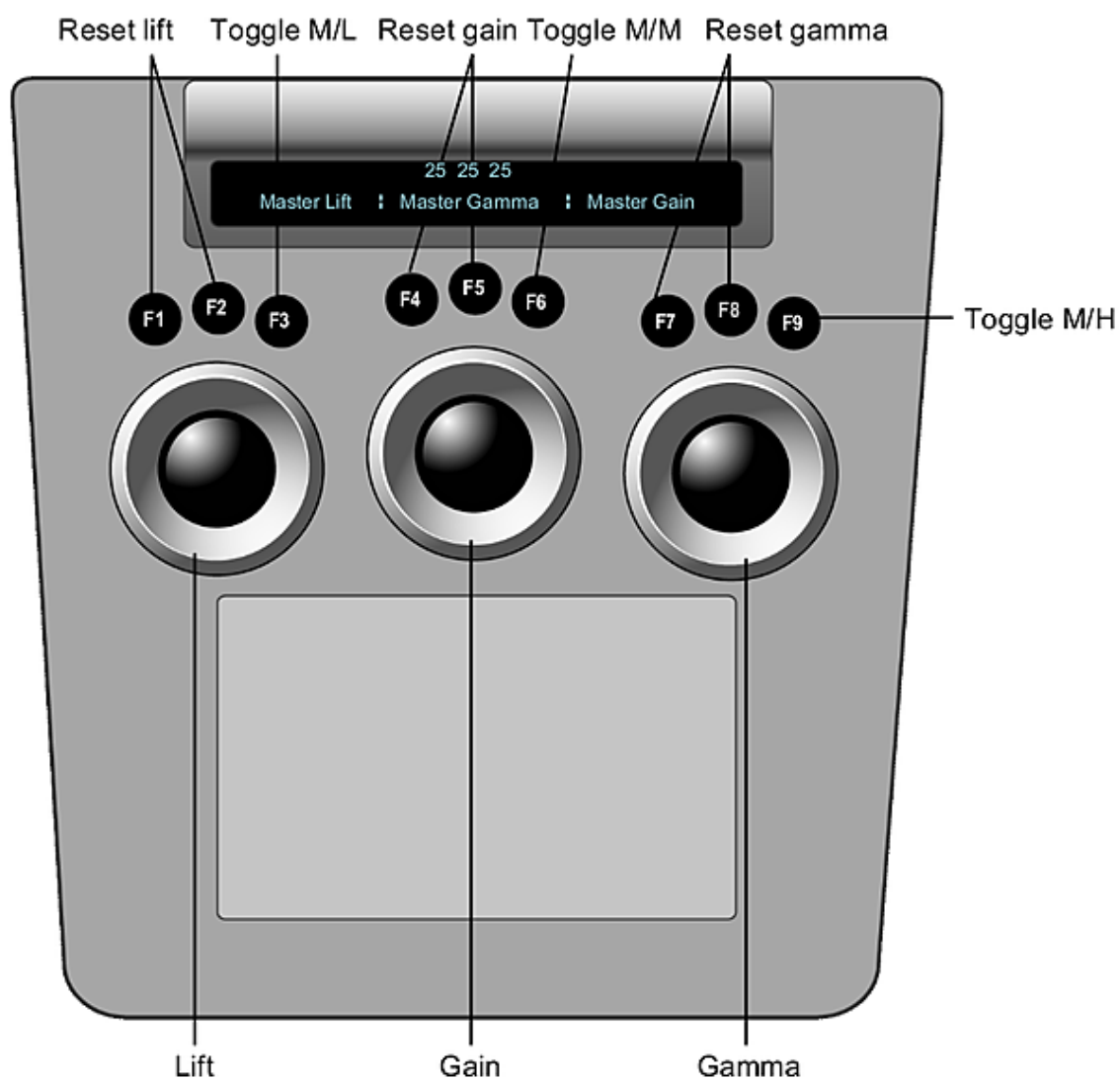
Linear mode:grading with the Autodesk control surfaceprimary colour grading:in Linear mode with the Autodesk control surfaceWhen Lin is enabled in the Setup Grade menu, the Colour Grading panel and the Function panel are activated with linear colour grading functionality.

Grading in Linear Mode Using the Colour Grading Panel

Use the Colour Grading panel to modify lift, gain, and gamma in the low, mid, and high levels of the image, or across the entire image.

To colour grade in Linear mode using the Colour Grading panel:

- 1 On the Colour Grading panel, use the following controls.



Use:	To:
First ring	Modify lift in the overall image. To reset, press the F1 button.
First jog ball	Modify lift in a range of colours. To reset, press the F2 button.
Second ring	Modify gain in the overall image. To reset, press the F4 button.
Second jog ball	Modify gain in a range of colours. To reset, press the F5 button.
Third ring	Modify gamma in the overall image. To reset, press the F7 button.
Third jog ball	Modify gamma in a range of colours. To reset, press the F8 button.
F3 button	Toggle between Master and Low levels.

Use:	To:
F6 button	Toggle between Master and Mid levels.
F9 button	Toggle between Master and High levels.

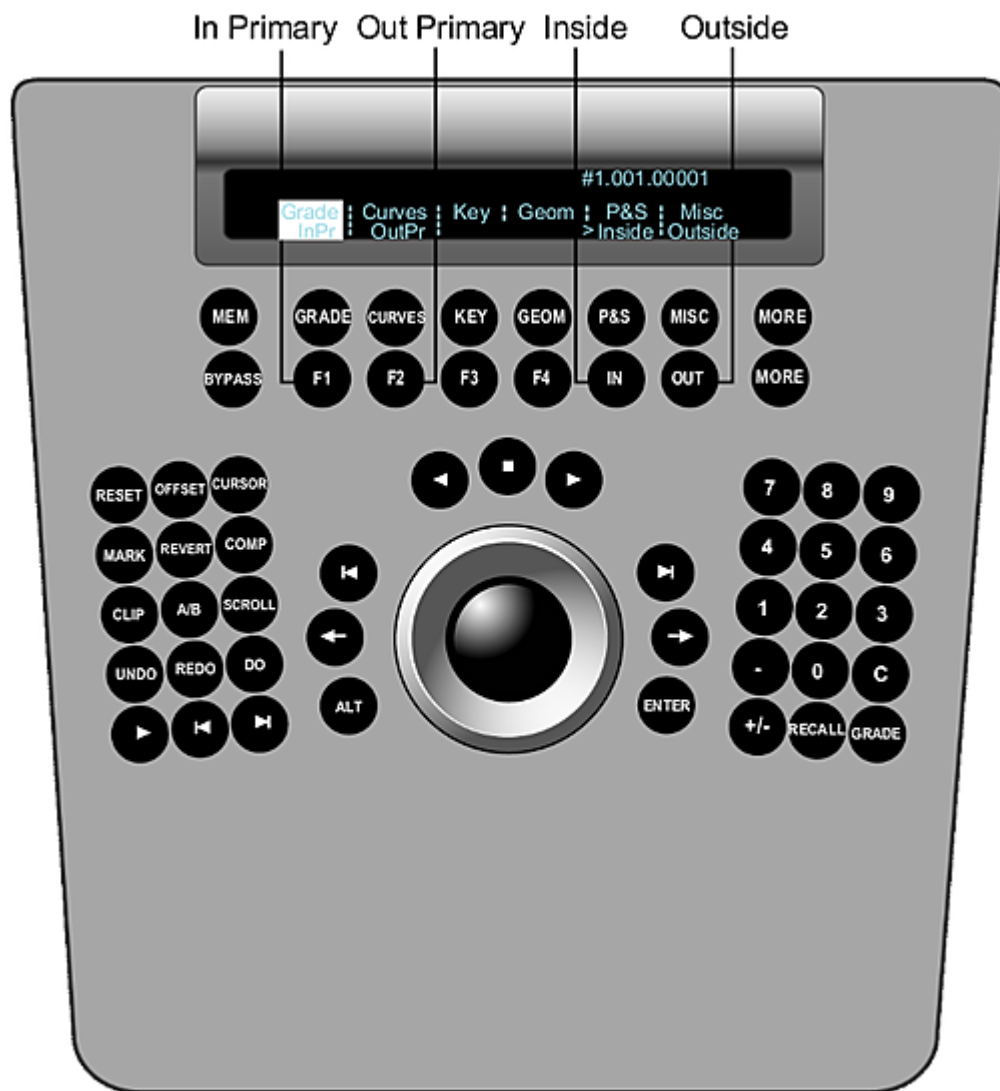
Grading in Linear Mode Using the Function Panel

When the Grade menu is enabled, you can use the Function panel to:

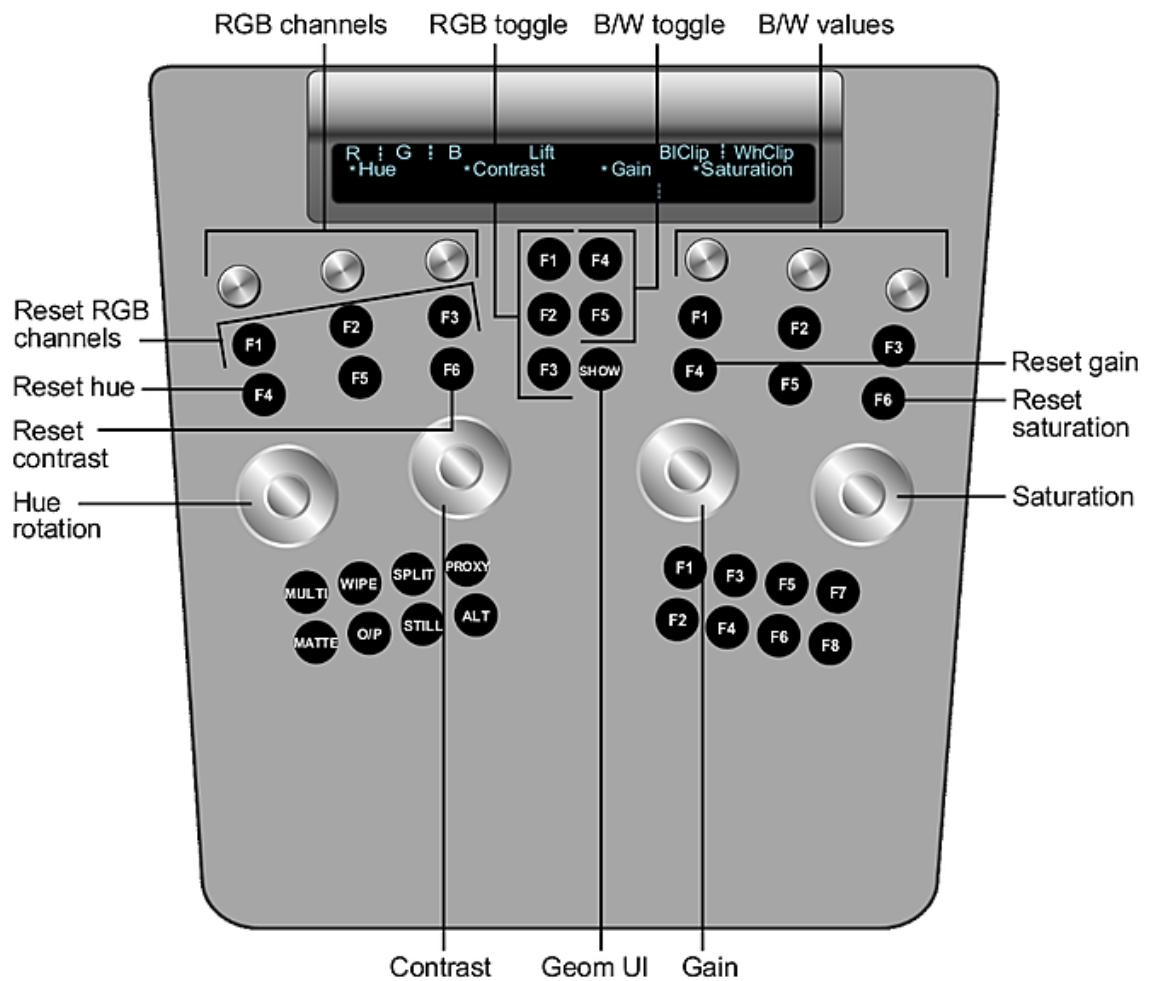
- Modify hue, contrast, gain, and saturation values.
- Balance lift, gamma, and gain values for the red, green, and blue channels.
- Set black and white clip and reference values.

To colour grade in Linear mode using the Function panel:

- 1 Press the Grade button on the Navigation panel.
The In Primary, Out Primary, Inside, and Outside options are activated.



- 2 Do one of the following:
 - Press the F1 option button to work on the initial primary grade.
 - Press the F2 option button to work on final curve modifications.
 - If you are colour grading a secondary, either a key or a geometry, use the numeric keys on the Navigation panel to select and enable a secondary layer. See [Adding Secondary Layers](#) (page 854).
- 3 If you are accessing the Grade menu after having created a geometry or key, do one of the following:
 - Press the IN option button to grade inside the secondary.
 - Press the OUT option button to grade outside the secondary.
- 4 On the Function panel, use the following controls.



Use:	To:
Wheels	Modify overall hue, contrast, gain, and saturation. Wheel 1=Hue Wheel 2=Contrast Wheel 3=Gain Wheel 4=Saturation To reset a wheel, press the button above it.
Knobs at top left	Balance the RGB channels. Knob 1=Red Knob 2=Green Knob 3=Blue To reset a knob, press the button below it.
Buttons in left centre column	Toggle the type of value to be adjusted in the RGB channels (Knobs 1-3). F1=Lift F2=Gamma F3=Gain

Use:	To:
Knobs at top right	Define values to clamp minimum and maximum luminance. Knob 4=Black Knob 5=White
Buttons in right centre column	Toggle the type of black and white values to be adjusted (Knobs 4-5). F4=Clip F5=Reference
SHOW button	Toggle the geometry wireframe on or off.

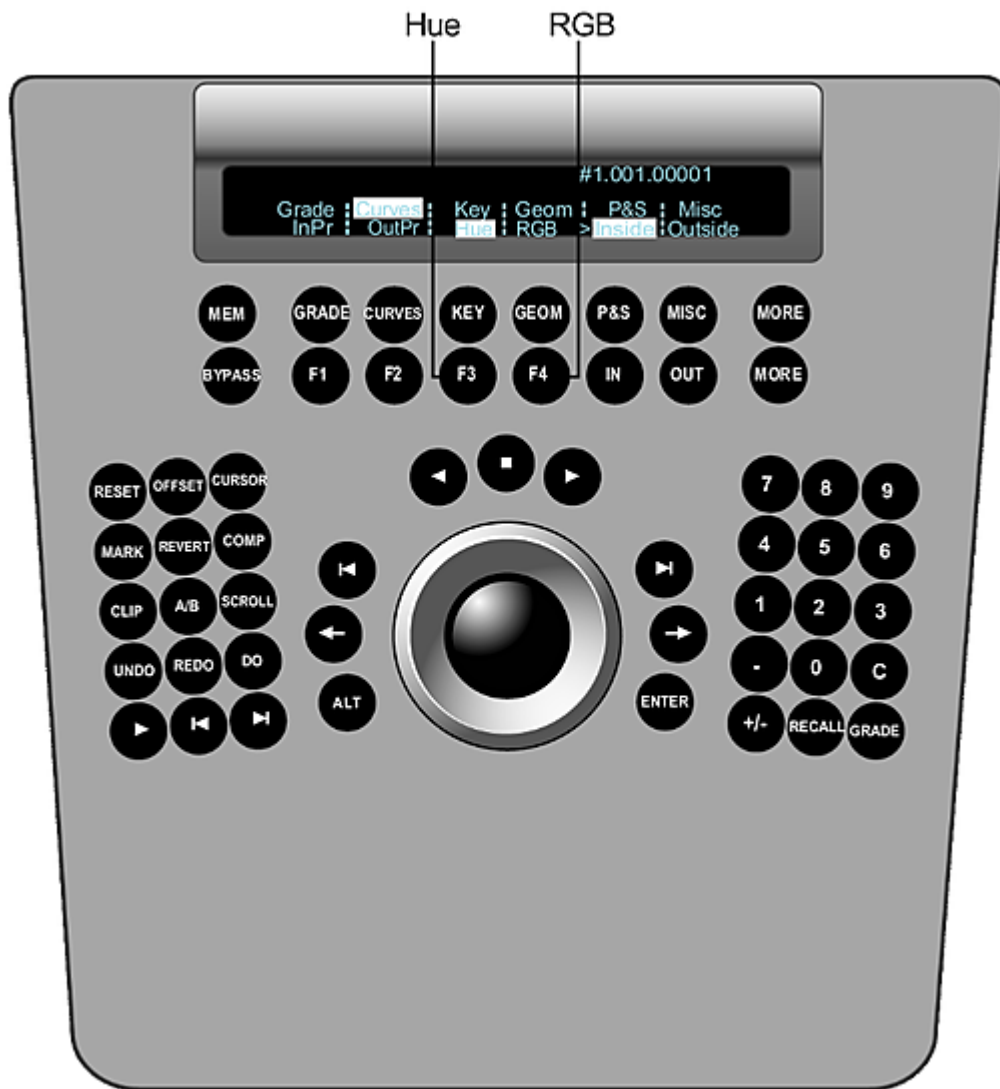
Performing Curves Grading

<\$nopage>grading.<italic> See <Default Para Font>colour gradingcolour grading:curves gradingcurves colour grading:with the Autodesk control surfaceWhen the Curves menu is enabled, you can use the Function panel to:

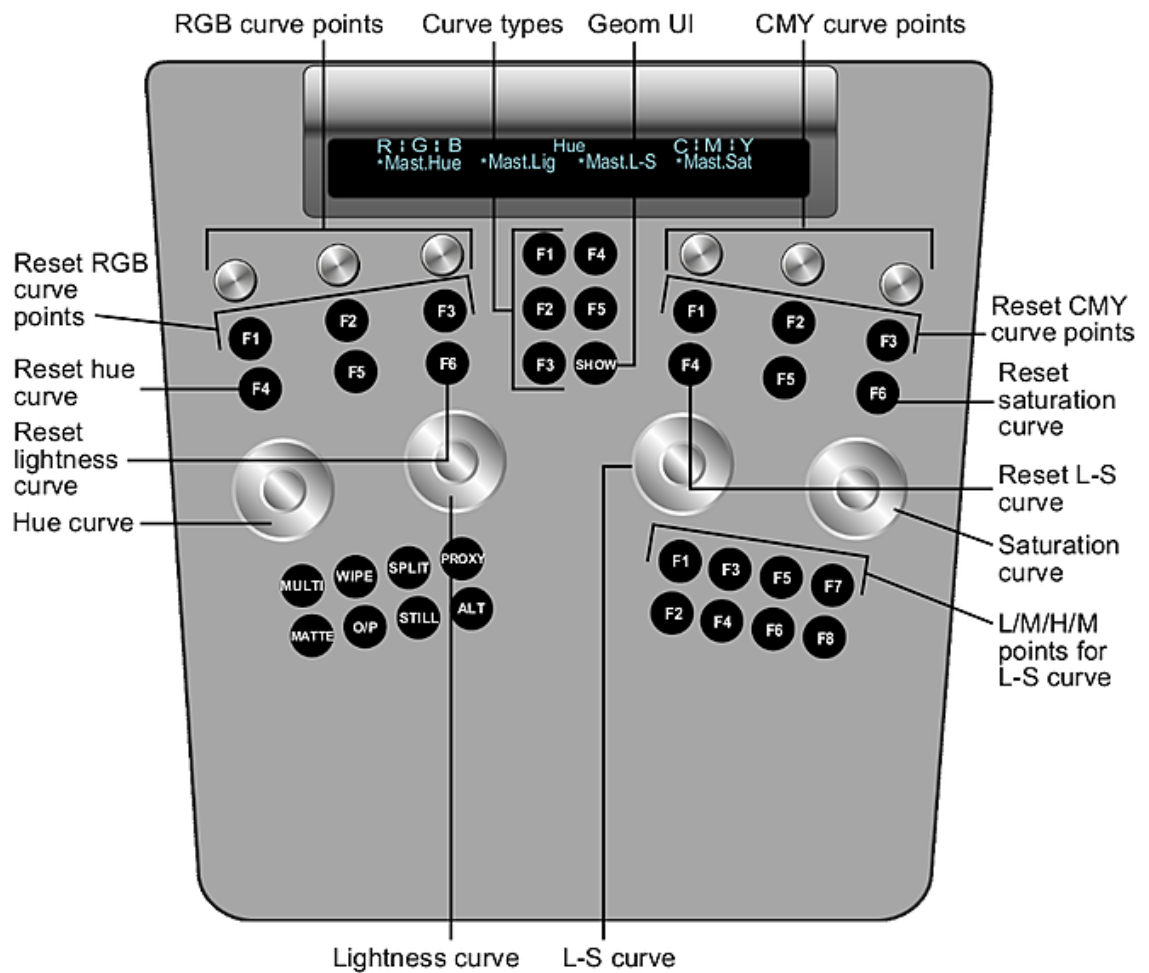
- Modify Hue and RGB curves either after the initial primary colour grade, or after the addition of any Lustre Sparks® effects.
- Adjust the Hue, Lightness, Saturation, and Luminance curves separately.
- Modify the entire curve uniformly or modify individual vertices for RGBCMY channels (red, green, blue, cyan, magenta, and yellow).

To modify Hue and RGB curves:

- 1 Press Curves on the Navigation panel.
The In Primary, Out Primary, Hue, and RGB options are activated.



- 2 Do one of the following:
 - Press the F1 option button to indicate that you are working on the initial primary grade.
 - Press the F2 option button to indicate that you are working on final curve modifications.
- 3 Do one of the following:
 - Press the F3 option button to work on Hue curves.
 - Press the F4 option button to work on RGB curves.
- 4 On the Function panel, use the following controls.

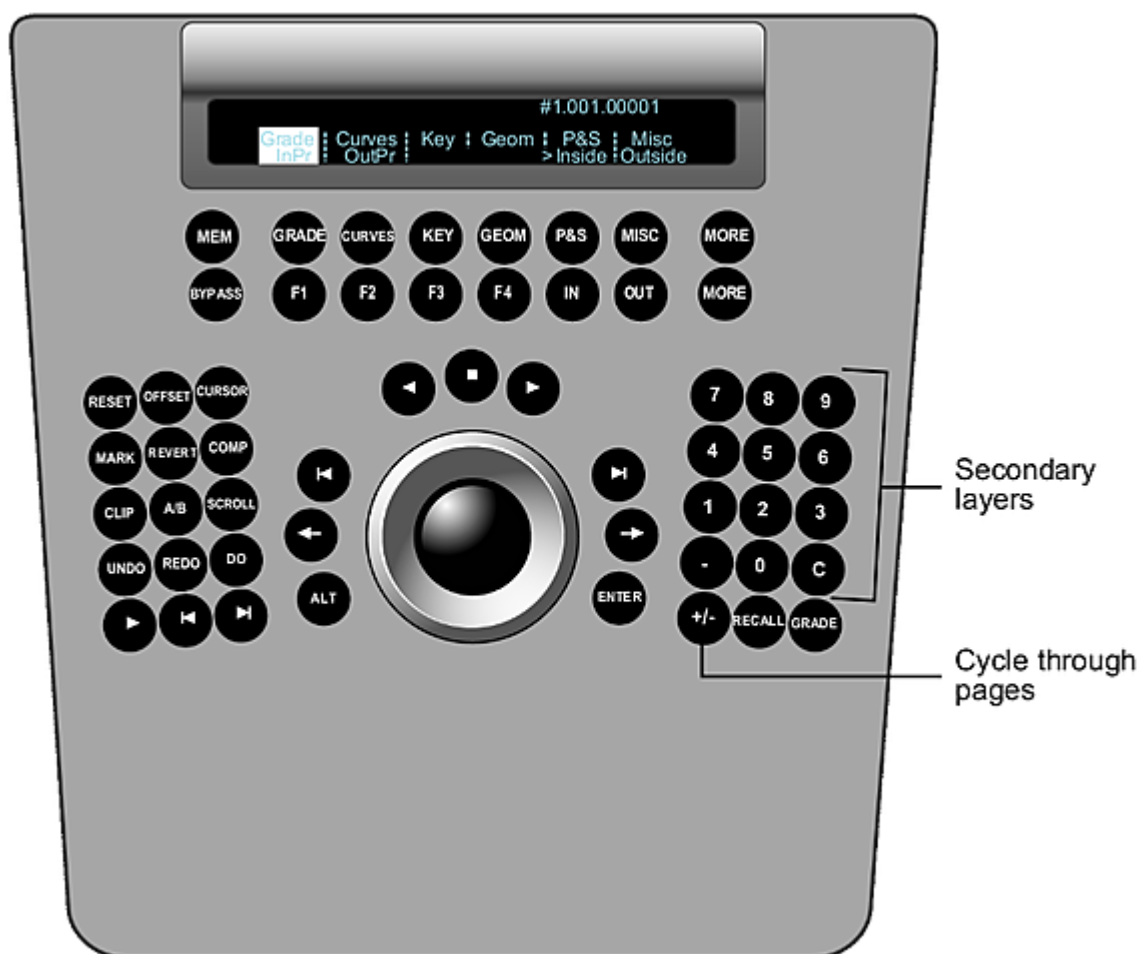


Use:	To:
Wheels	Make overall changes to curves. Wheel 1=Hue curves Wheel 2=Lightness curves Wheel 3=L-S curves Wheel 4=Saturation curves To reset a wheel, press the button above it.
Knobs at top left and top right	Individually modify RGBCMY curve points. Knob 1=Red Knob 2=Green Knob 3=Blue Knob 4=Cyan Knob 5=Magenta Knob 6=Yellow To reset a knob, press the button below it.
Buttons in centre column	Select the type of curve to be modified using the RGBCMY curve points. F1=Hue F2=Light

Use:	To:
	F3=Saturation If you press the F1 button when working with RGB curves, you are toggled to Hue curves.
First row of buttons at bottom right	Select the low point, mid point, high point, or all for the L-S curve. F1=Low F3=Mid F5=High F7=Master
SHOW button	Toggle the geometry wireframe on or off.

Adding Secondary Layers

secondary layersSecondary layers are used to colour grade specific hues and areas within an image. You can create up to 48 secondary layers for each shot within your project. Secondary layers can be added to your shot by accessing the numerical buttons on the Navigation panel. You can add layers to your shot from the Grade, Curves, Key, or Geometry menu. Once a secondary layer has been created, it can be modified by generating keys and geometries, removing grain, or by adding Lustre Sparks Effects.



Press:	To:
0-9, -, or C	Select, activate, or deactivate a layer. The buttons on the Navigation panel correspond to the position of the secondary layer on the user interface, and not to the actual numbers. For example, press 7 for layer 1. Press the button once to select a layer. Press the button twice to activate/deactivate a layer.
+/-	Cycle through the four pages of secondary layers. Each page consists of 12 secondary layers (e.g., P1 displays layers 1-12, P2 displays layers 13-24, etc.).

Extracting Keys

keys:extracting Lustre provides two separate keyers for extracting keys. When the Key menu is enabled, you can use the Function panel to work with:

- The Hue, Luminance, and Saturation (HLS) Keyer. See [Extracting Keys using the HLS Keyer](#) (page 856).
- The Diamond Keyer. See [Extracting Keys using the Diamond Keyer](#) (page 861).

NOTE The keyer default is set in the Lustre user interface. See the Tools Settings section in the Project Management chapter of the *Autodesk Lustre User Guide*.

Extracting Keys using the HLS Keyer

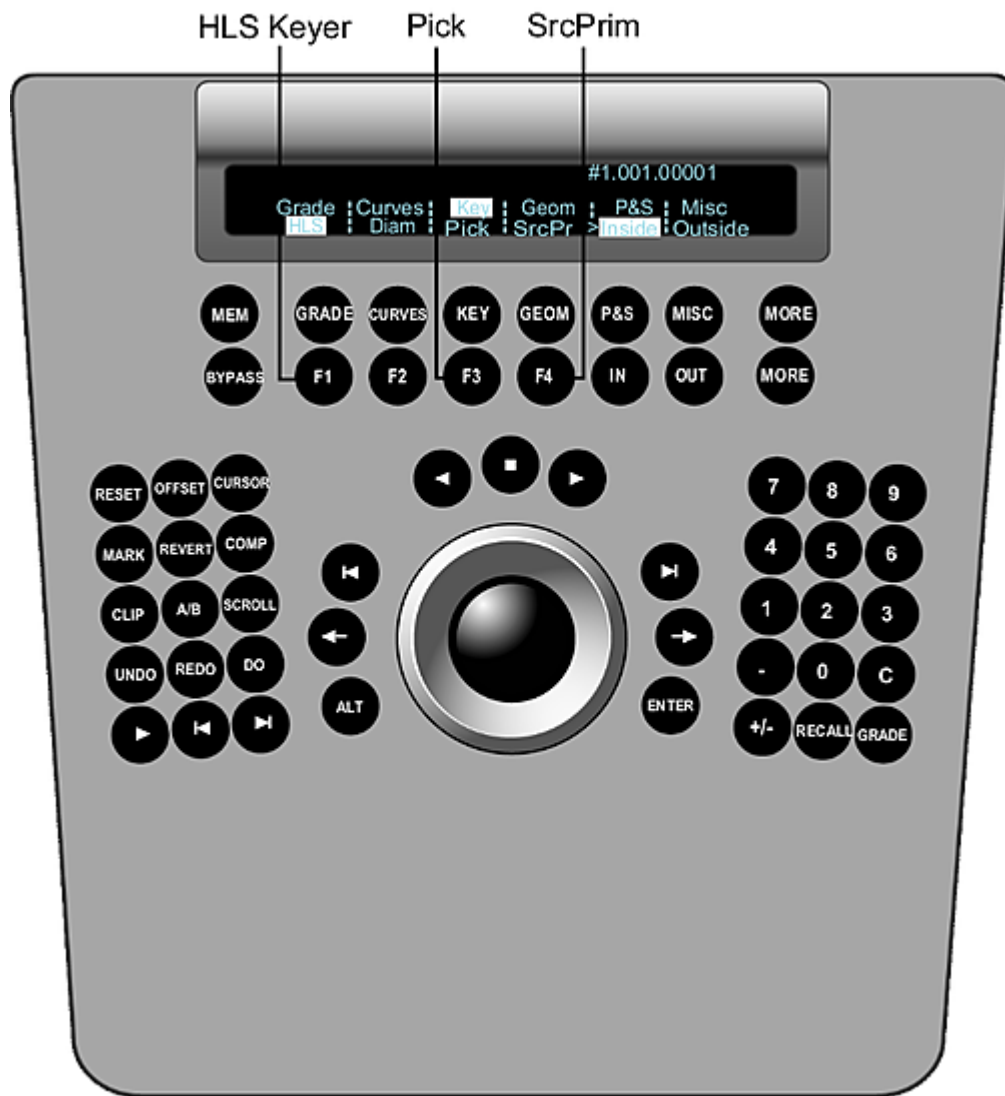
secondary colour grading:extracting keys with the Autodesk control surface, HLS Keyerkeying:with the Autodesk control surface, HLS Keyerkeying:with HLS KeyerHLS Keyer:extracting keyssecondary colour grading:creating keys with HLS KeyerUse the Navigation panel to:

- Enable the HLS Keyer.
- Select a secondary layer.
- Sample the image.
- Extract a key.

Use the Function panel to adjust the key by setting softness and tolerance ranges, modify key edges, invert the key, and link layers.

To enable the HLS Keyer in the Navigation panel:

- 1 Press the Key button once to activate the Key menu, and then press F1 to enable the HLS Keyer. The HLS Keyer and Inside are enabled.



To select a secondary layer in the Navigation panel:

- 1 Use the numeric keys to select and enable a secondary layer. Press the number key once to select the layer, and then double-press it to enable it. To enable layer 10, press the minus button (-). To enable layer 11, press 0. To enable layer 12, press the C button.

To sample the image in the Navigation panel:

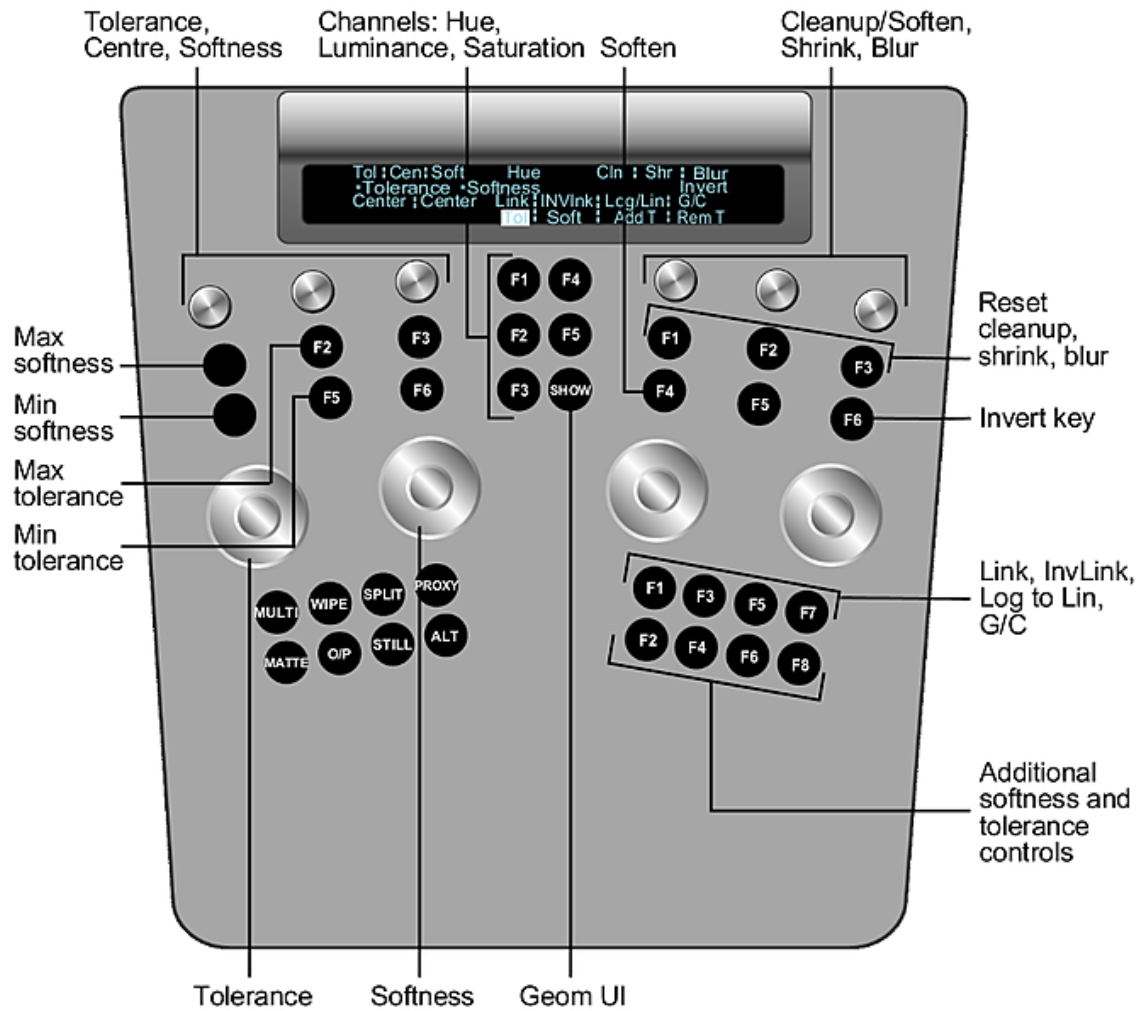
- 1 Press F3 (pick). The trackball on the Navigation panel is activated as a picker, allowing you to move through the image. Press F3 again to pick the current pixel for the sample. To sample an area of the image, hold down the ALT button while in picker mode and draw, with the trackball, a rectangular area of the image, and then release the ALT button.

To extract a key in the Navigation panel:

- 1 To extract a key after input primary grading has been performed, press F4. To switch back to the primary-graded result, press F4 again.

To adjust a key in the Function panel:

- 1 Use the following controls listed in the table below to adjust the key for the sampled colour.



Use:	To:
Wheels	Adjust the tolerance and softness around the picked colour. Wheel 1=Tolerance Wheel 2=Softness
Knobs at top left	Adjust minimum/maximum tolerance, centre tolerance, and minimum/maximum softness. Knob 1=Minimum/maximum tolerance Knob 2=Centre Knob 3=Minimum/maximum softness
Upper left F1 and F4 buttons	Enable either minimum or maximum tolerance (Knob 1) adjustments. F1=Minimum F4=Maximum

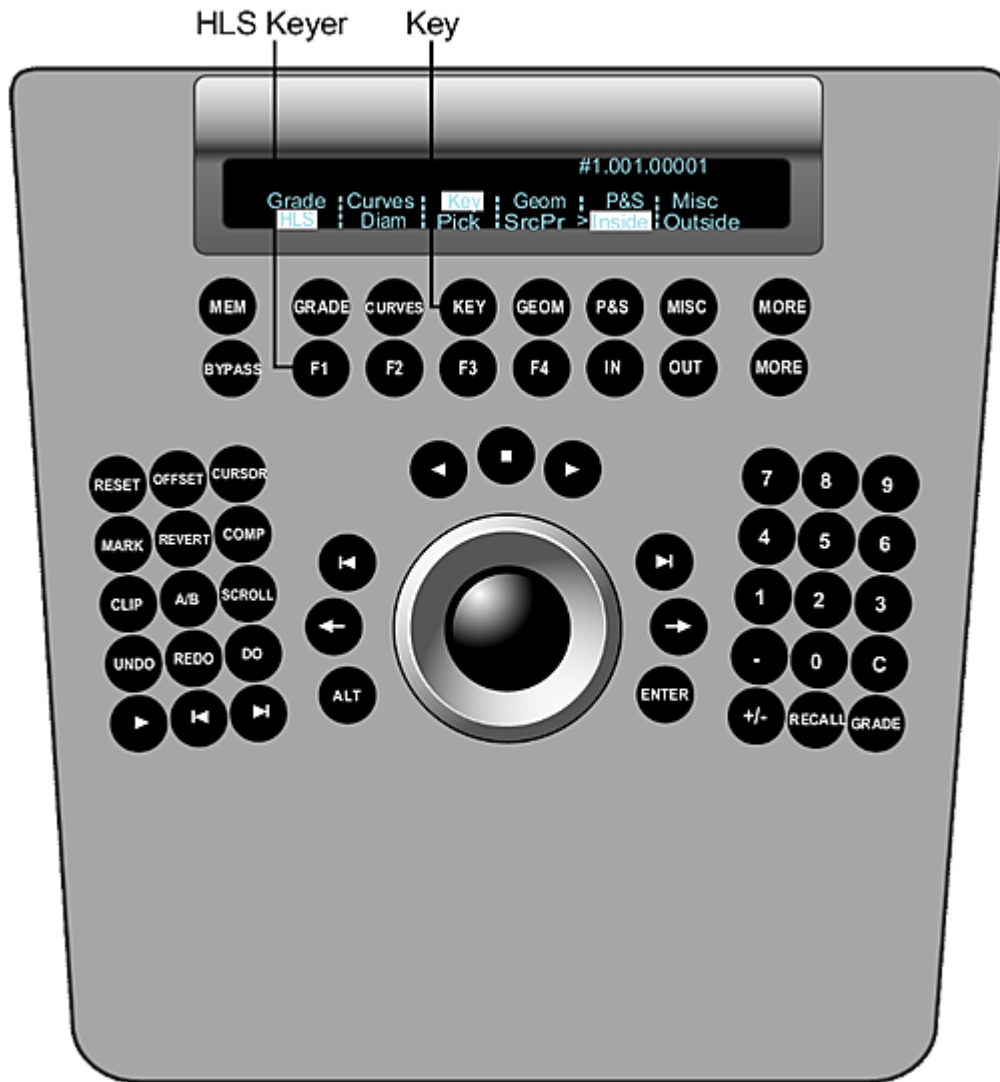
Use:	To:
Upper left F3 and F6 buttons	Enable either minimum or maximum softness (Knob 3) adjustments. F3=Minimum F6=Maximum
Buttons in centre column	Adjust tolerance, centre, and softness values separately for each of the channels forming the basis of the key. F1=Hue F2=Luminance F3=Saturation
Knobs at top right	Modify key edges and remove stray pixels from a key. Knob 4=Cleanup Knob 5=Shrink Knob 6=Blur
Buttons at top right	Press F1 to enable cleanup (Key-out), shrink, and blur. Press F4 to enable soften (Key-in filter). F1=Cleanup F2=Shrink F3=Blur F4=Soften Single press F2 and F3 to reset shrink and blur, respectively. Double-press F1 and F4 to reset cleanup and soften, respectively.
Upper right F6 button	Invert the key.
First row of buttons at bottom right	Press F1 to cycle through add, intersect, subtract, or link layers. F1=Add, intersect, subtract, or link F3=Invert link F5=Log to Lin F7=GPU compatibility
Second row of buttons at bottom right	Add or subtract tolerance and softness from the key. F2=Tolerance F4=Softness F6=Add softness/tolerance F8=Subtract softness/tolerance Press F3 on the Navigation panel to change the cursor into a picker prior to using any of the above buttons. When done defining tolerance and softness, press F3 again.
SHOW button	Toggle the geometry wireframe on or off.

Toggling the Keyer Button and Keyer Channels On and Off

Users can toggle the on or off status of the Keyer button visible on the Navigation panel. Users can also enable or disable any or all of the Hue, Luminance, or Saturation channels on the Function panel.

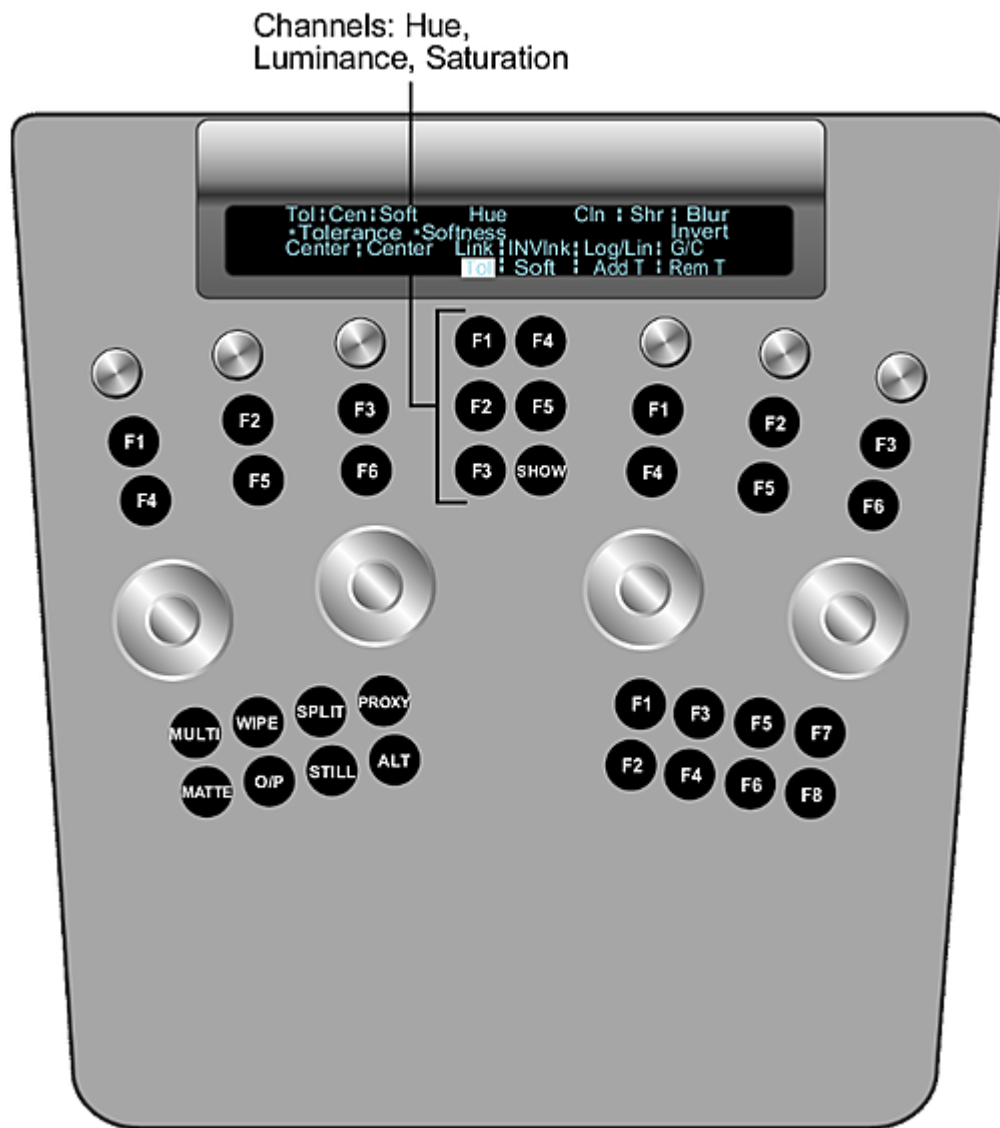
To make the HLS Keyer status visible on the Navigation panel:

- 1 Press the Key button once to activate the Key menu, and then press F1 to enable the HLS Keyer channel and activate backlighting to show its enabled status.
- 2 Double-press the F1 button to disable the HLS Keyer channel.
The HLS Keyer is disabled in the Lustre application.



To enable or disable the Hue, Luminance, or Saturation channels on the Function panel:

- 1 Double-press F1, F2, or F3.



Extracting Keys using the Diamond Keyer

secondary colour grading:creating keys with the Autodesk control surface, Diamond Keyerkeying:with the Autodesk control surface, Diamond Keyerkeying:with Diamond KeyerDiamond Keyer:extracting keyssecondary colour grading:extracting keys with Diamond KeyerUse the Navigation panel to:

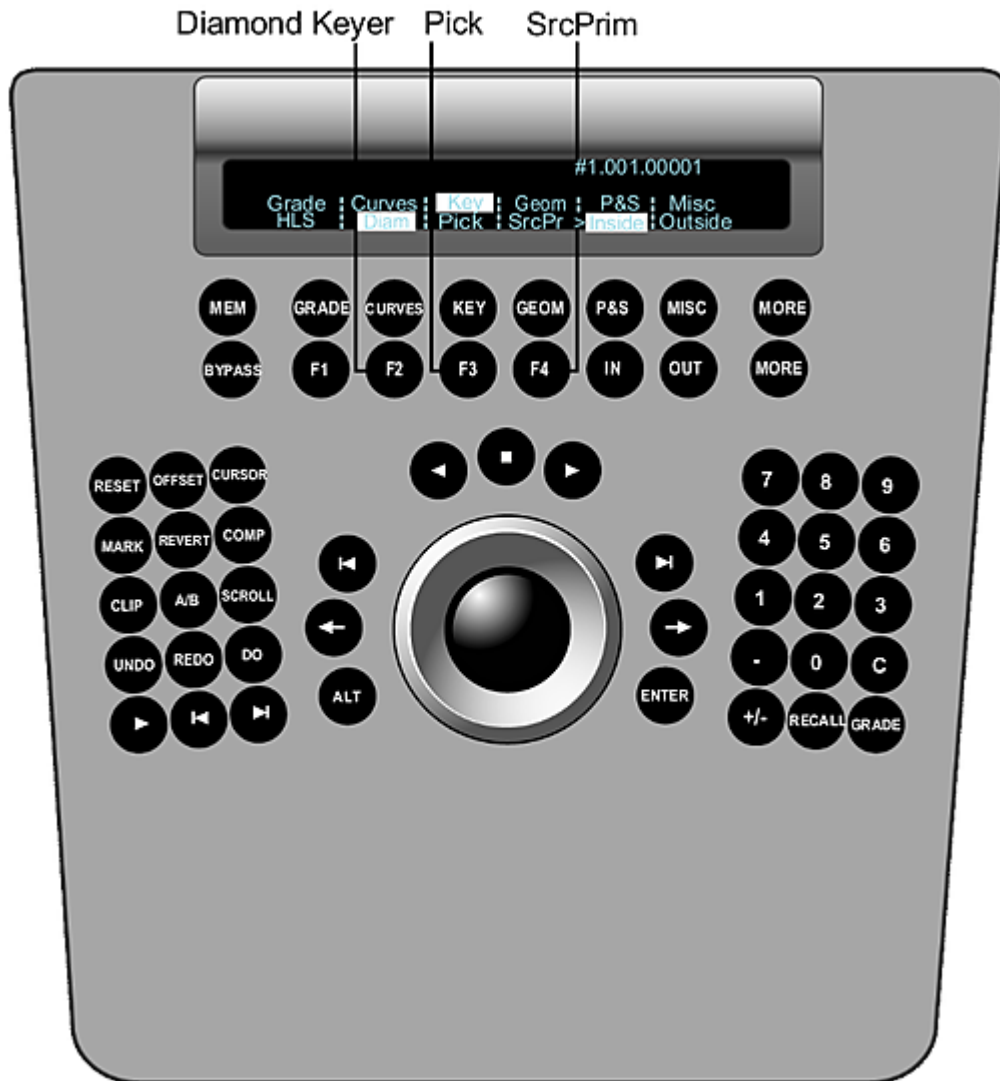
- Enable the Diamond Keyer.
- Select a secondary layer.
- Sample the image.
- Extract a key.

Use the Function panel to adjust the key by setting softness and tolerance ranges, modify key edges, invert the key, and link layers.

To enable the Diamond Keyer in the Navigation panel:

- 1 Press the Key button once to activate the Key menu, and then press F2 to select the Diamond Keyer. The Diamond Keyer is enabled.

NOTE To hide/show the hue cube, press Alt+Show.



To select a secondary layer in the Navigation panel:

- 1 Use the numeric keys to select and enable a secondary layer. Press the number key once to select the layer, and then double-press to enable it. To enable layer 10, press the minus button (-). To enable layer 11, press 0. To enable layer 12, press the C button.

To sample the image in the Navigation panel:

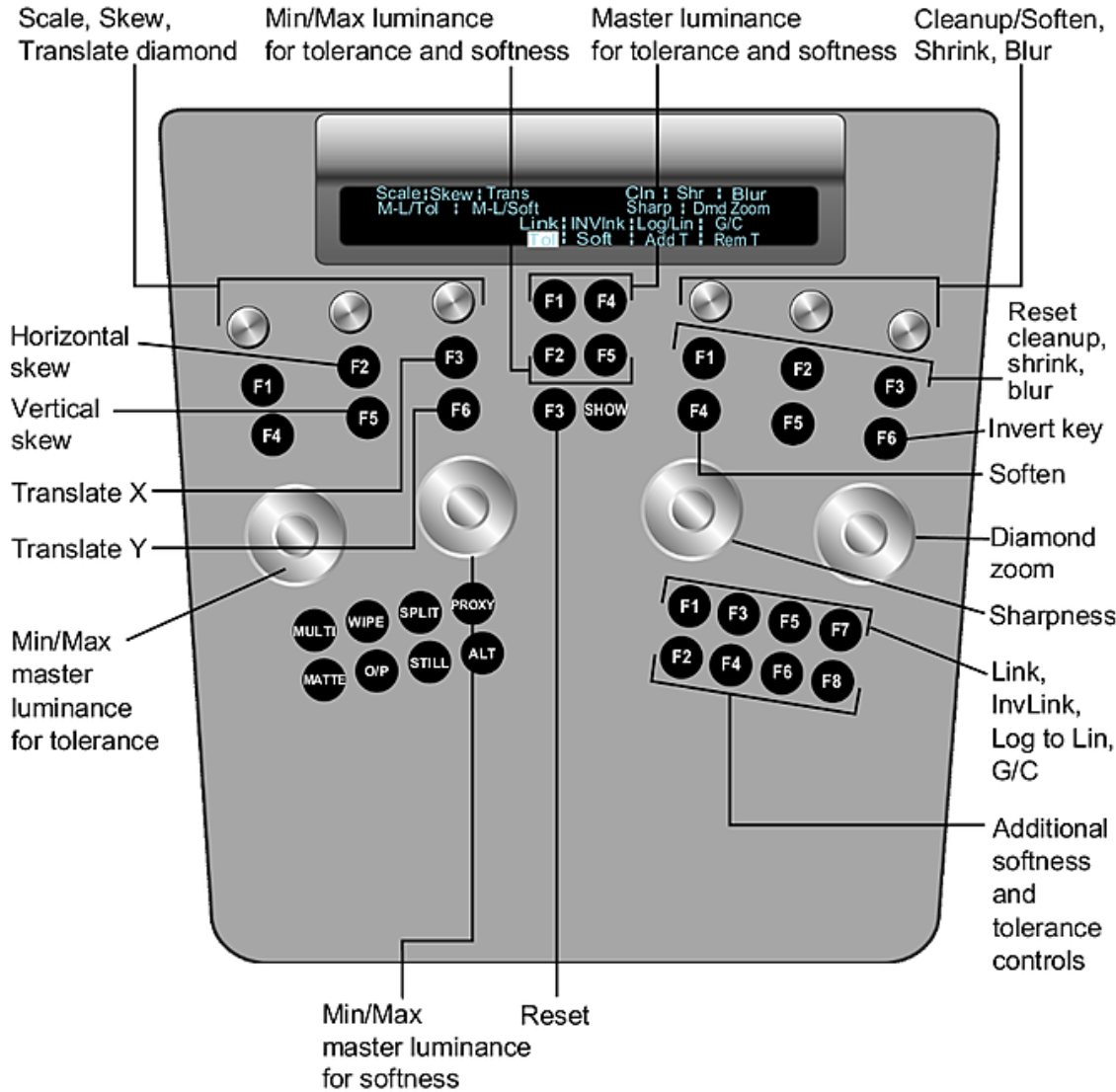
- 1 Press F3 (pick). The trackball on the Navigation panel is activated as a picker, allowing you to move through the image. Press F3 again to pick the current pixel for the sample. To sample an area of the image, hold down the ALT button while in picker mode and draw, with the trackball, a rectangular area of the image, and then release the ALT button.

To extract a key in the Navigation panel:

- 1 To extract a key after input primary grading has been performed and the input LUT has been applied, press F4. To switch back to the primary-graded result, press F4 again.

To adjust a key in the Function panel:

- 1 Use the following controls listed in the table below to adjust the key for the sampled colour.



Use:	To:
Wheels	Adjust tolerance, softness, and sharpness around the picked colour. Zoom in (left) and zoom out (right). Wheel 1= Tolerance Wheel 2= Softness Wheel 3= Sharpness Wheel 4= Zoom in/out

Use:	To:
Knobs at top left	Scale, skew, or translate (move) the chrominance Softness and chrominance Tolerance Diamonds. Knob 1=Scale Knob 2=Skew Knob 3=Translate
Upper left F2 and F5 buttons	Skew the chrominance Tolerance or chrominance Softness Diamonds horizontally and vertically. F2=Horizontal skew F5=Vertical skew
Upper left F3 and F6 buttons	Move the Softness Diamond or Tolerance Diamond left or right, up or down. F3=X-axis (left or right) F6=Y-axis (up or down)
Buttons in centre column	Enable master luminance for tolerance and softness and minimum/maximum luminance levels for tolerance and softness. F1=Master luminance for tolerance F2=Minimum/maximum for luminance for tolerance F4=Master luminance for softness F5=Minimum/maximum luminance for softness
Knobs at top right	Modify key edges and remove stray pixels from a key. Reduce image grain and noise, and keep edges intact prior to keyer input processing. Knob 4=Cleanup/Soften toggle Knob 5=Shrink Knob 6=Blur
Upper right buttons	Press F1 to enable cleanup (Key-out filter), shrink, and blur. Press F4 to enable soften (Key-in filter). F1=Cleanup F2=Shrink F3=Blur F4=Soften Single-press F2 and F3 to reset shrink and blur, respectively. Double-press F1 and F4 to reset cleanup and soften, respectively.
Upper right F6 button	F6=Invert the key
First row of buttons at bottom right	Press F1 to cycle through add, intersect, subtract, or link layers. F1=Add, intersect, subtract, or link F3=Invert link F5=Log to Lin F7=GPU Compatibility (G/C)
Second row of buttons at bottom right	Add softness/tolerance and remove softness/tolerance. F2=Tolerance F4=Softness

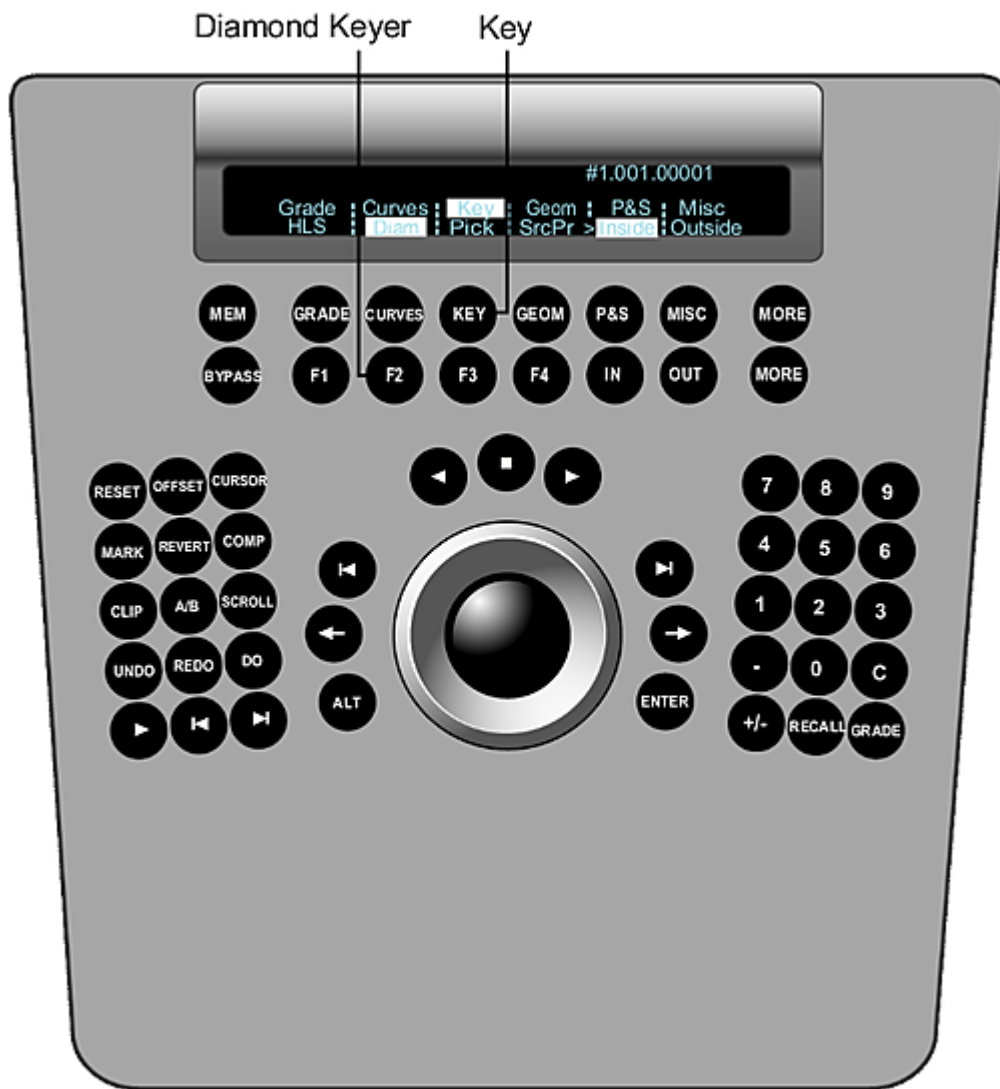
Use:	To:
	F6=Add softness/tolerance F8=Remove softness/tolerance Press F3 on the Navigation panel to change the cursor into a picker prior to using any of the above buttons. When done defining tolerance and softness, press F3 again.
ALT+SHOW buttons	Toggle the hue cube on or off.

Toggling the Diamond Keyer Button On and Off

Users can toggle the on or off status of the Diamond Keyer button visible on the Navigation panel.

To make the Diamond Keyer status visible on the Navigation panel:

- 1 Press the Key button once to activate the Key menu, and then press F1 to enable the Diamond Keyer and activate backlighting to show its enabled status.
- 2 Double-press the F1 button to disable the Diamond Keyer.
The Diamond Keyer is disabled in the Lustre application.



Creating and Grading Geometries

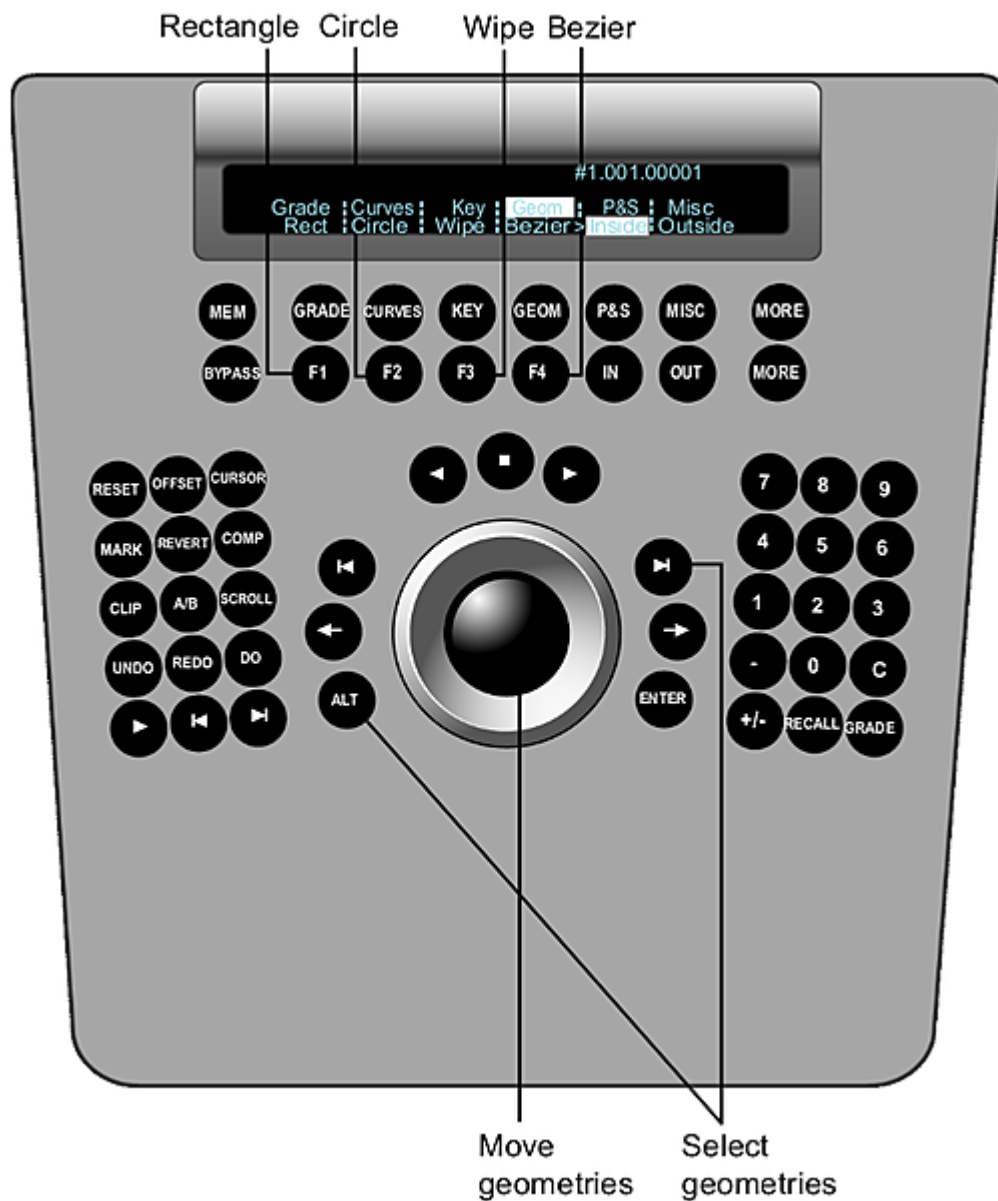
colour grading:secondaries with the Autodesk control surfacesecondary colour grading:creating geometries with the Autodesk control surfacegeometries:creating with the Autodesk control surfaceWhen the Geom menu is enabled, you can create and colour grade up to 12 secondaries by using the Function panel to:

- Select a geometry type.
- Modify geometries.
- Link secondary layers.
- Delete geometries.

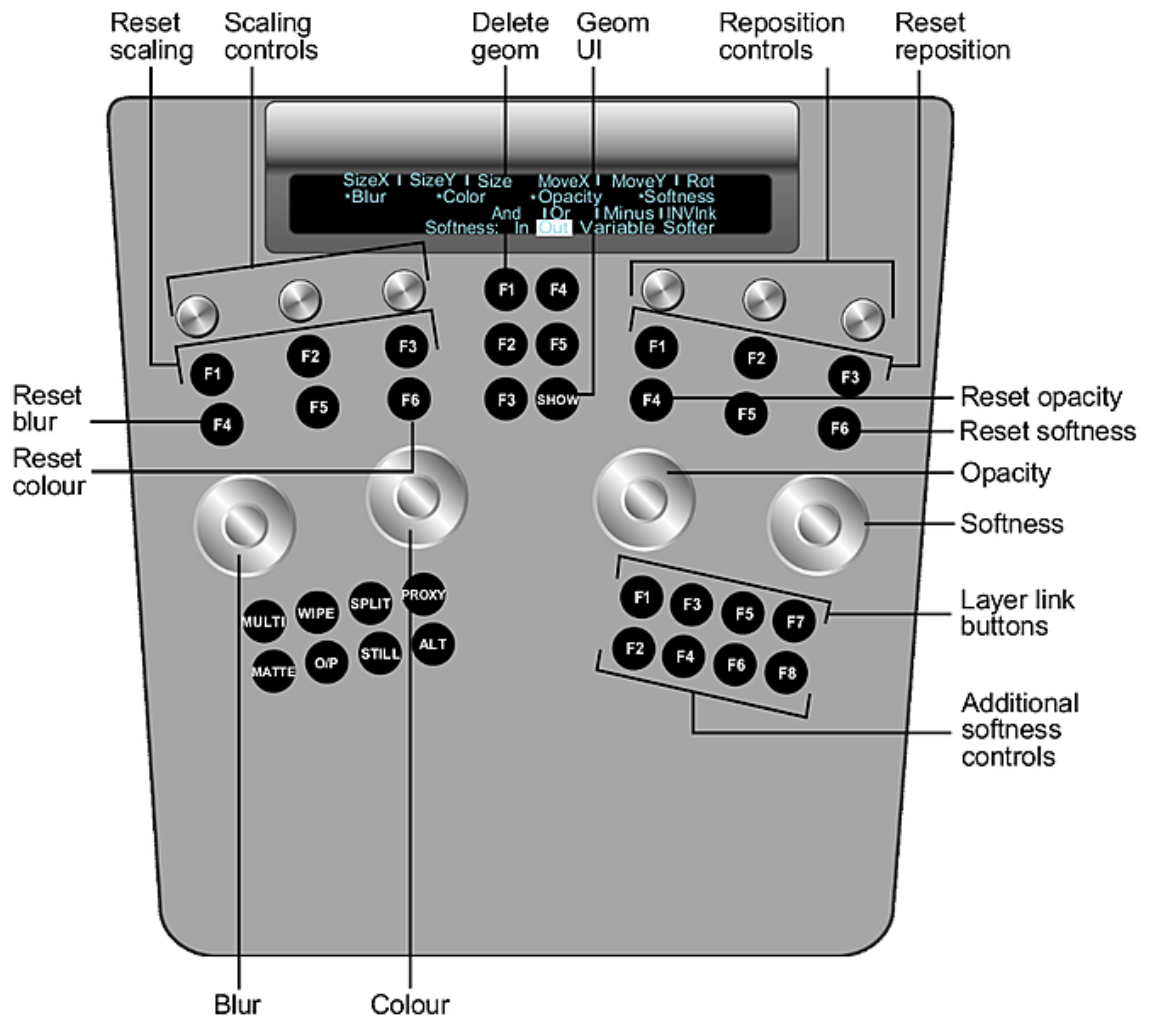
After you have created geometries, you can use the Grade menu to colour grade them.

To create geometries:

- 1 Press the Geom button on the Navigation panel.
The Rectangle, Circle, Wipe (in Dual view), and Bezier (free-form geometry) options are activated.



- 2 Use the numeric keys on the Navigation panel to select and enable a secondary layer. Press the number key once to select the layer, and then press it a second time to enable it. To enable layer 10, press the minus button (-). To enable layer 11, press 0. To enable layer 12, press the decimal button (.).
- 3 Do one of the following:
 - Press F1 to add a rectangle.
 - Press F2 to add a circle.
 - Press F3 to add a wipe.
 - Press F4 to add a Bezier shape using the pen or mouse.
- 4 Use the jog ball as a geometry mover and press the ALT and shot forward buttons to select the geometries on the current active secondary layer.
- 5 On the Function panel, use the following controls to adjust the geometry.



Use:	To:
Wheels	Modify the geometry's blur, colour, opacity, and softness. Wheel 1=Blur Wheel 2=Colour Wheel 3=Opacity Wheel 4=Softness The direction for edge softness is inwards or outwards depending on the direction that you rotate the wheel. To reset a wheel, press the button above it.
Knobs at top left	Scale the geometry. Knob 1=Size X Knob 2=Size Y Knob 3=Master (scales in locked proportions) To reset a knob, press the button below it.
Knobs at top right	Move the geometry. Knob 1=Move X Knob 2=Move Y

Use:	To:
	Knob 3=Rotate To reset a knob, press the button below it.
First row of buttons at bottom right	Link secondary layers. F1=Add F3=Intersect F5=Subtract F7=Invert link
Second row of buttons at bottom right	Further modify softness. F2=Apply softness inside mask border F4=Apply softness outside mask border F6=Apply variable softness F8=Change softness type
F1 button in centre column	Delete the currently active geometry.
SHOW button	Toggle the geometry wireframe on or off.

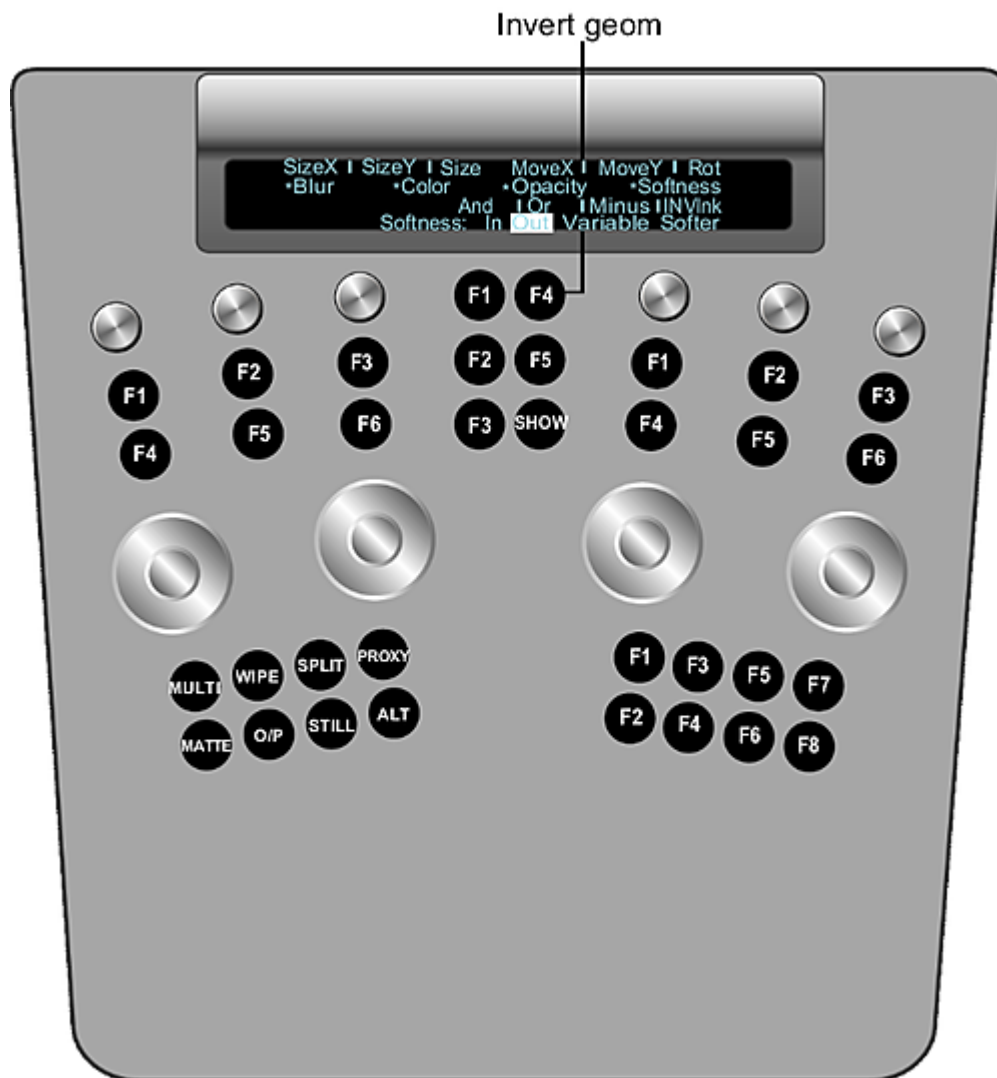
- 6 To colour grade the geometry, select either the Inside or Outside option button depending on whether colour grading should occur inside or outside the geometry. See [Performing Colour Grading](#) (page 840).

Geometry Invert Functionality

Users can invert geometries on the current secondary layer using the Autodesk control surface.

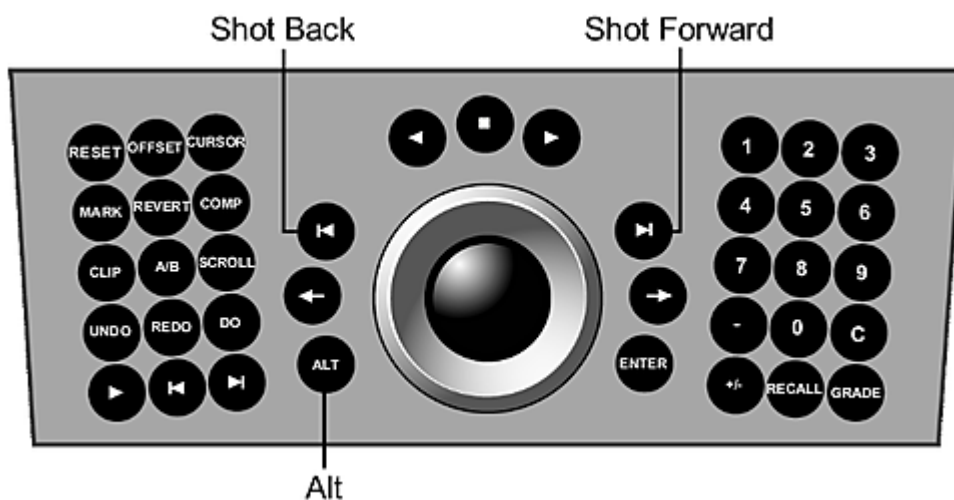
To invert geometries using the Autodesk control surface:

- 1 On the Function panel, press the F4 button in the centre column.



Cycling Among Geometries

You can now move from one geometry to the next in the order of their creation.



To cycle among geometries:

- 1 With the Geom menu enabled, hold down the ALT button on the Navigation panel and then press the Shot Forward or Shot Back button to cycle forward or backwards.

Working with Stereoscopic Projects

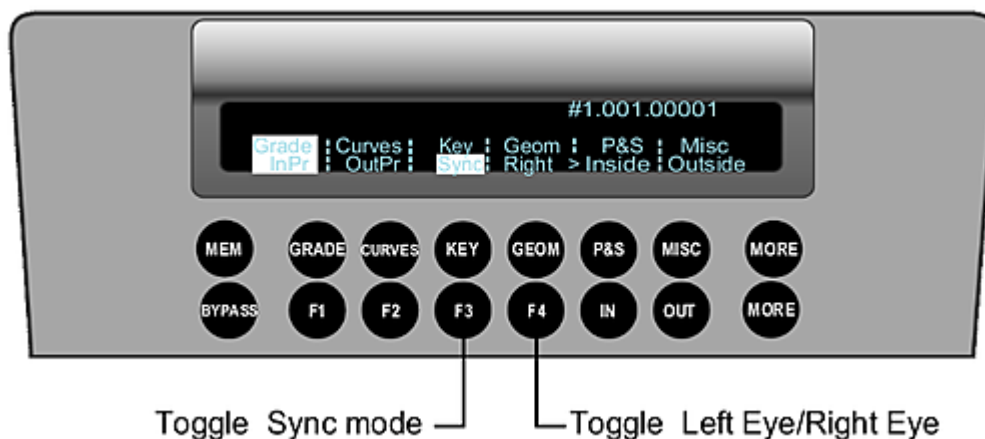
stereoscopy:accessing features with Autodesk control surfaceThe Autodesk Control Surface panel accommodates common stereoscopic workflow operations. You must be in the Colour Grading or P&S menu to use these controls.

Using the Navigation panel, you can change the Sync mode state. You can also switch between the Left Eye and Right Eye.

When you are in Sync mode, you can use the Function panel to toggle the Convergence tool. See [Repositioning Shots](#) (page 838).

To adjust stereoscopic features in the Navigation panel:

- 1 In the Navigation panel, enable the Grade or P&S menu.



- 2 You can use the following controls.

Press:	To:
F3	Toggle Sync mode.
F4	Toggle the assigned eye.

The Sync mode state and the assigned eye are displayed in the digital displays of the Navigation panel and Colour Grading panel. When Sync mode is enabled, the “L+R” appears in the digital display to indicate that grading affects both eyes.

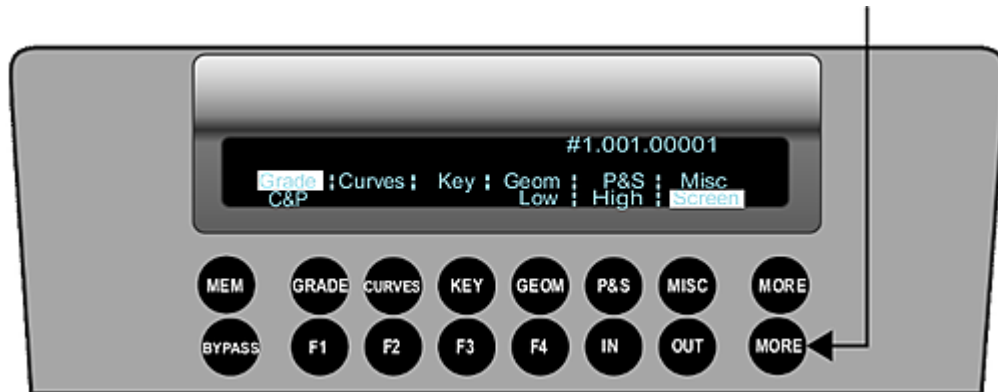
Modifying the Appearance of the Autodesk Control Surface

You can customize the appearance of the control surface by accessing options from the bottom More button on the Navigation panel. Use these options to determine the brightness of:

- Backlighting for all buttons.
- Backlighting for a button being pressed.
- Backlighting for active and available buttons.
- The digital display.

To modify the appearance of the Autodesk control surface:

- 1 Press the bottom More button on the Navigation panel.



The Low, High, and Screen options appear in the digital display.

- 2 Press one of the following option buttons and use the ring portion of the trackball to increase or decrease brightness.

Press:	To change the brightness of:
F4	Backlighting for all buttons on the control surface. The change is visible as you modify with the ring.
IN	Backlighting for a button that is being pressed. The change is visible only when you press a button after having used the ring.
OUT	The digital display. The change is visible as you modify with the ring.

ACS Hotkeys

Use these hotkeys on the Navigation panel.

Press:	To:
ALT + MEM	Enable the cache.
ALT + BYPASS	Bypass all menu parameters.
ALT + RESET	Reset the zoom and pan.
ALT + MARK	Add keyframes to all animation channels in the current frame.
ALT + DO	Save the current grade file and cut.

Press:	To:
 + 	Temporarily apply the grade from the previous shot to the current shot.
 + 	Temporarily apply the grade from the next shot to the current shot.
 + 	Cycle backward among the geometries (this is only applicable when the geometry menu is enabled).
 + 	Cycle forward among the geometries.

The Tangent CP100 Control Surface

35

Tangent CP100:overviewcontrol surfaces:Tangent CP100You can accomplish many of the tasks you do in the Lustre user interface using the Tangent CP100 control surface. The Tangent CP100 control surface is only supported on the Master Station.

While you learn how to do each of these tasks, you can show the user interface so that you can view the results in the menus. To operate the control surface, do any of the following:

- Press a button to select the displayed option.
- Turn a dial to increase or decrease the value of the displayed channel or parameter. Turn clockwise to increase the value. Turn counter-clockwise to decrease it.
- Use the Player controls to navigate the Storyboard.
- Use the trackballs to modify the displayed parameter.

Customizing the View

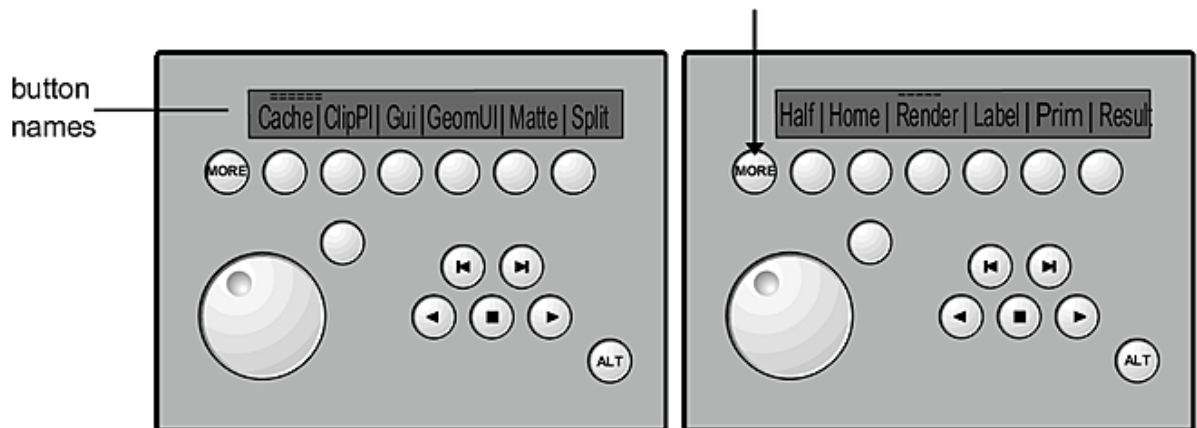
customizing:the view with the Tangent CP100view options:accessing with the Tangent CP100Use the controls on the lower right of the control surface to change the view as you work on your grades. For example, enable Half to view a half-resolution version of your shot in the Player.

You can select any of the following options.

Control Surface	Description	Hotkey or UI Option
GUI	Toggles the full-screen Player.	Enter
Geom UI	Shows or hides a geometry for the current secondary.	Show button in Secondaries menu
Matte	Switches between secondary view and result view.	F11 and F12
Split	Switches on and off split view in the Player. When you enable Split, you can press the PERFM button to enable multi-view and view up to 16 shots, or press the CUE button to switch between horizontal and vertical split view. These buttons are located on the upper right of the control surface.	F5, F3, and F4

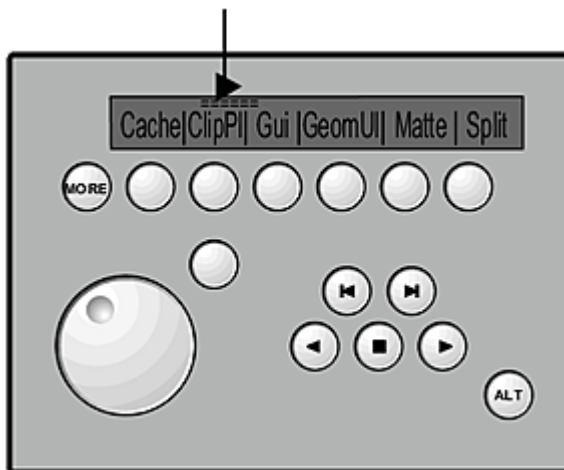
Control Surface	Description	Hotkey or UI Option
Half	Switches between the full-resolution and half-resolution (proxy) version of your shot in the Player. If you have not rendered a proxy, an X appears in the Player.	F9
Zoom/Home	Switches between the 1x and 2x zoom.	F10
Render	Switches between a rendered version of your shot and output view. If you have not rendered the shot, an X appears in the Player.	P
Label	Toggles the shot name text on the image.	W
PRIM	Toggles the display of your shot. Displays your shot as it appears after modifications are made from the Grading or Curves menu, or as it currently appears (with the entire colour grade applied). You can use this option only after you have added secondaries.	I
Result	Displays the shot as it currently appears—with the grade applied.	O

NOTE Press the MORE button to view all the available options.



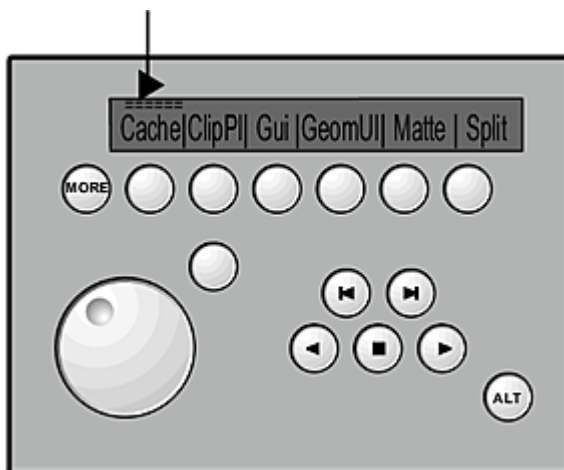
Toggling Play Mode

looping:using the Tangent CP100play modes:toggling with the Tangent CP100You can loop play a shot or the entire Storyboard using the ClipPI button. This button corresponds to the Play Mode button in the user interface.



Caching Memory

memory:caching with the Tangent CP100
caching:memory with the Tangent CP100
When a shot does not play back in real time, you can cache the frames into memory using the Cache button or by pressing M.

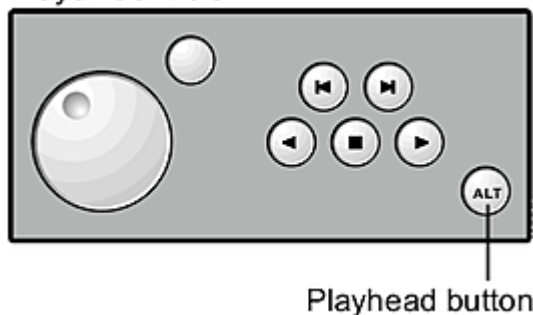


Navigating the Storyboard

navigating:with the Tangent CP100
Storyboard:navigating with the Tangent CP100
Use the Player controls on the lower right and the scrolling controls on the left to navigate the Storyboard.

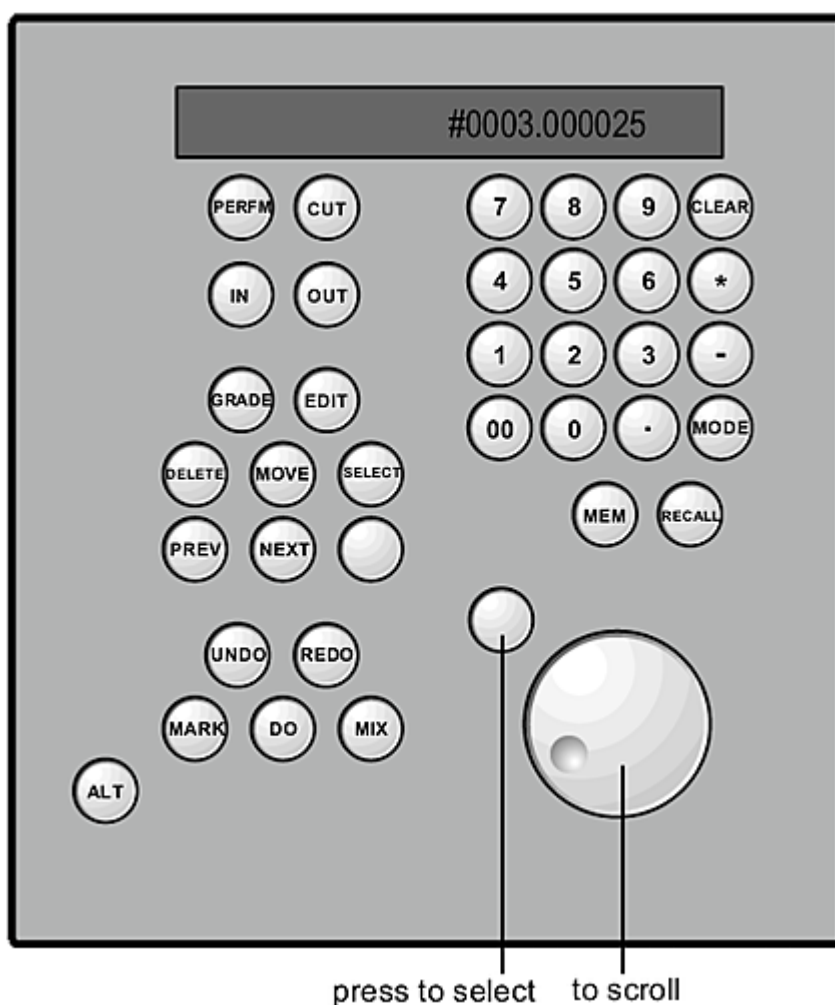
Use the left dial (jog knob) and transport controls to play and scrub the Storyboard. You can also use the Alt button to switch between shots assigned to Playhead A and Playhead B.

Player Controls



Use the right dial to scroll through the shots in the Storyboard. When you scroll, a yellow arrow in the Storyboard marks your position. You can then select the shot by pressing the button next to the dial.

NOTE If the shot is outlined in blue, you are in copy mode. See [Copying Grades](#) (page 881).



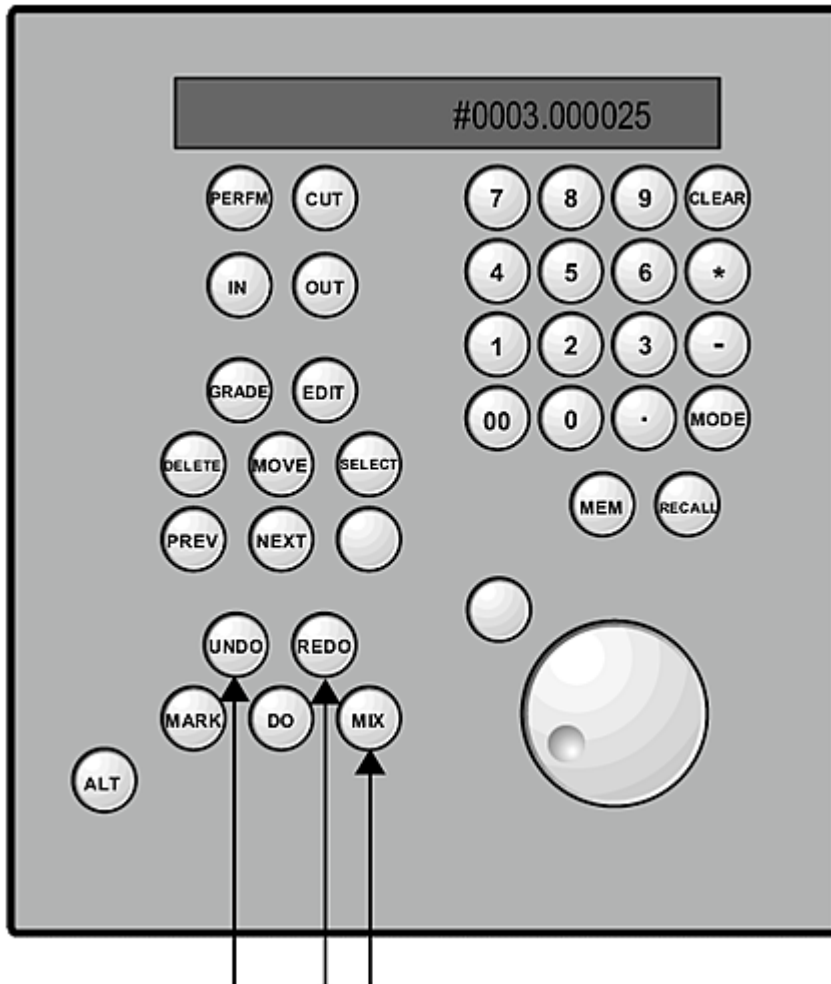
You can show the Storyboard all the time or only when you scroll. To show the Storyboard all the time, press **Tab** on the keyboard. To show the Storyboard only when you scroll, first hide it by pressing **Tab**, and then scroll the Storyboard. In this mode, you hide the Storyboard again by pressing the button next to the scroll dial.

Undo List

redoing:with the Tangent CP100undoing:with the Tangent CP100The undo list works differently on the control surface than it does in the user interface. Use the buttons on the lower right of the control surface to work with the undo list.

Saving to the Undo List

When you use the control surface, you must save your changes to the undo list. Undo lists are saved on a shot-by-shot basis. To save a change to the undo list, press Do. You can then press Undo and Redo to go through the undo list.



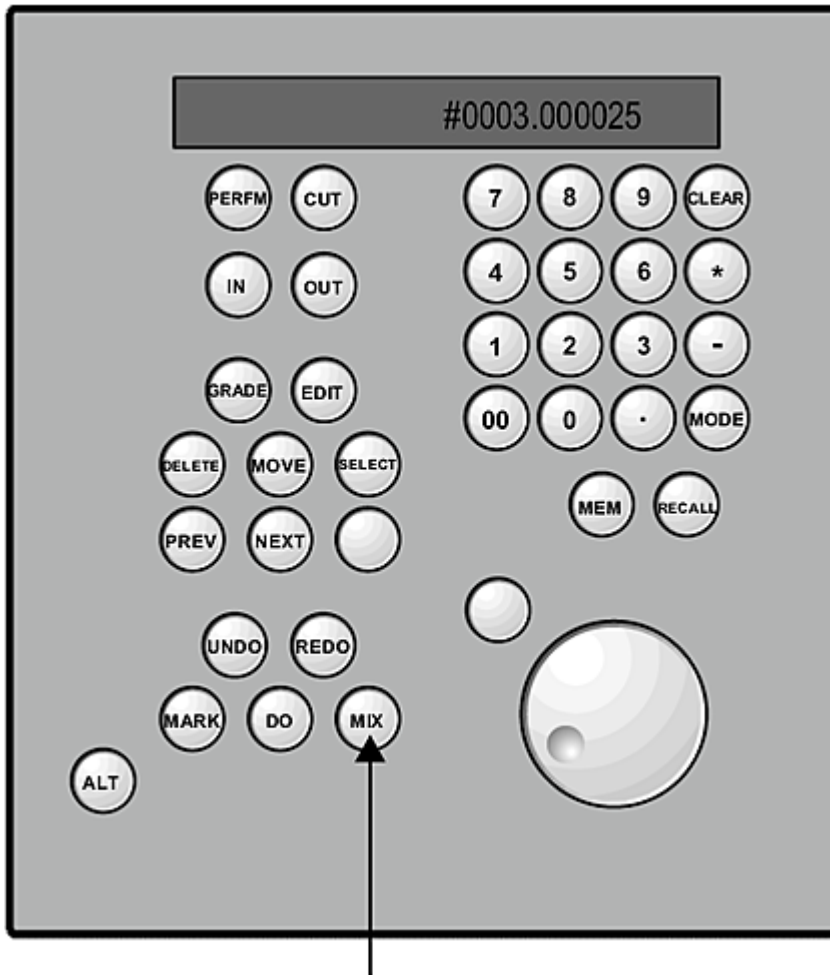
Reverting to Previous Grades

reverting to previous:grades with the Tangent CP100grades:reverting to previous with the Tangent CP100Use the Alt button on the lower right to toggle between the grade that was applied to a shot when you first selected it in the Storyboard and the current grade.

TIP To save the reverted stage to the undo list, press Do.

Comparing Grades

comparing:grades with the Tangent CP100grades:comparing with the Tangent CP100You can compare the current image with the grade you last committed to the undo list. To toggle between these settings, use the Mix button.

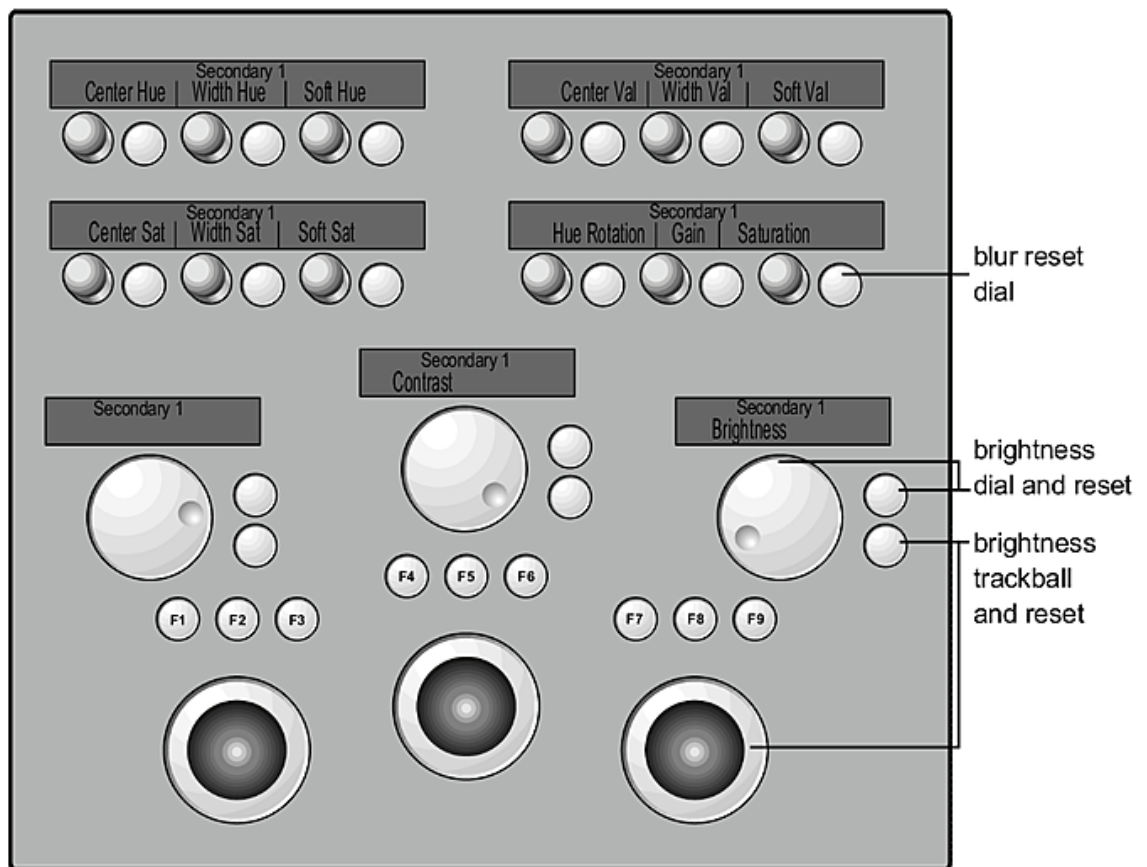


Resetting Parameters

menus:resetting with the Tangent CP100parameters:resetting with the Tangent CP100resetting:with the Tangent CP100On a shot-by-shot basis, you can reset the parameters set in some menus. You can also reset a single parameter.

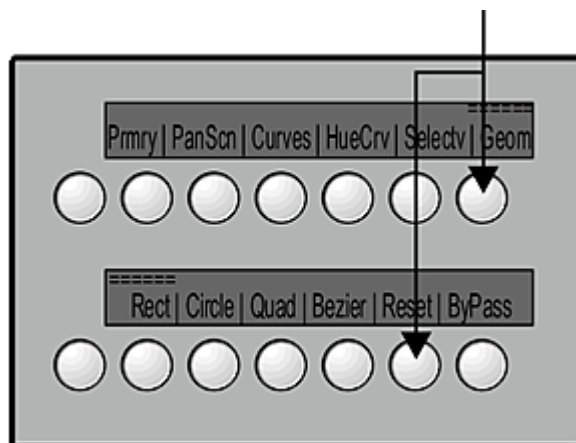
To reset a parameter:

- 1 Press the Reset button associated with the dial or trackball.



To reset a menu:

- 1 Select the menu and then enable Reset. For example, select Geom, and then press Reset to clear all secondaries.



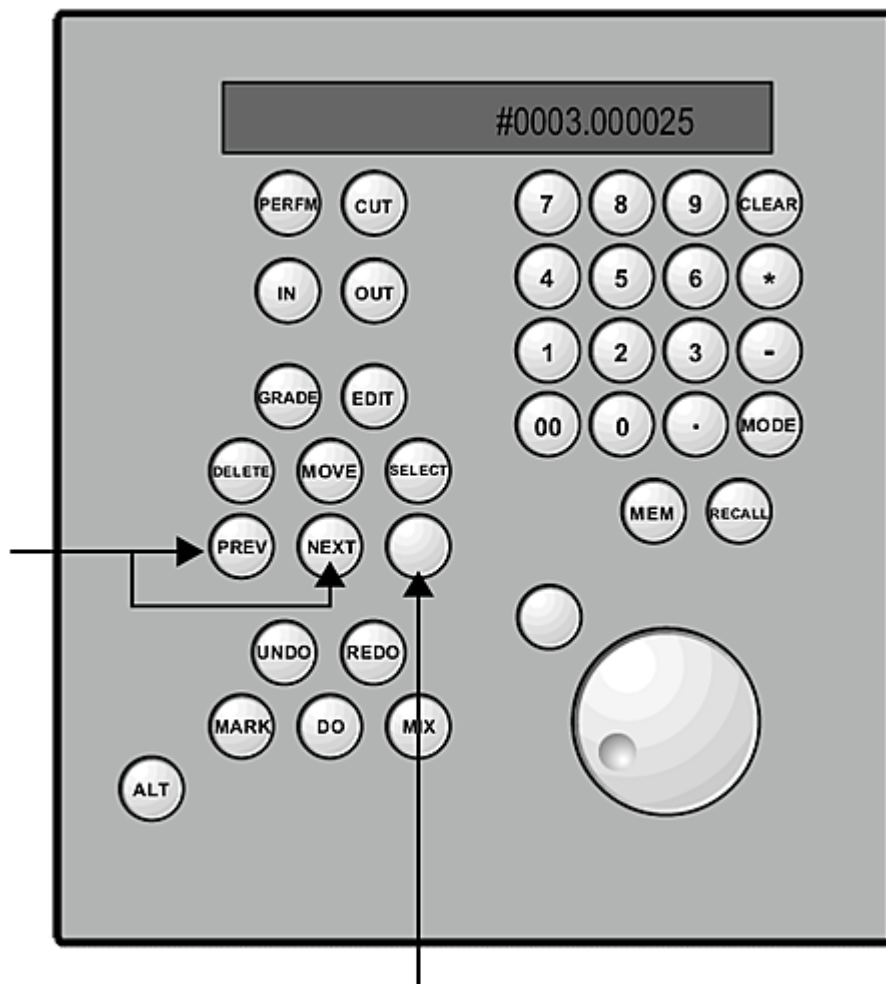
Copying Grades

copying:grades with the Tangent CP100grades:copying with the Tangent CP100You can temporarily or permanently copy a grade from another shot in the Storyboard to the current shot.

To copy grades:

- 1 Do one of the following:
 - Press Prev or Next to temporarily apply the grade from the previous or next shot to the current shot (outlined in red or magenta). Press Prev or Next multiple times to move through the shots in the Storyboard. The selected shot is outlined in blue.
 - Press Offset and then scroll through the shots. As you scroll, the grades are temporarily applied to the current shot (outlined in red or magenta). The selected shot is outlined in blue.

TIP Press the Offset button again to switch to scroll mode.



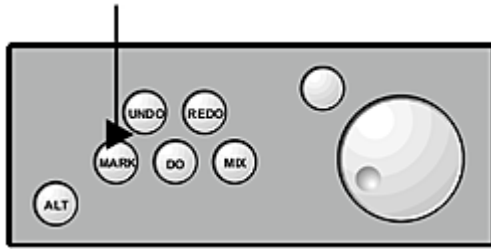
- 2 Press Do to permanently copy the grade from the shot outlined in blue to the current shot.

Adding and Moving Keyframes

animating;with the Tangent CP100keyframes:adding and moving with the Tangent CP100When you animate parameters, you can set keyframes using the Mark button. You can also adjust the timing of the first and last keyframes in the shot.

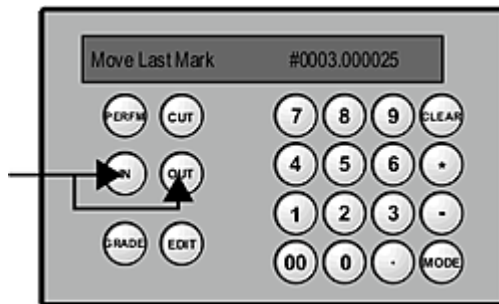
To add a keyframe:

- 1 Go to the frame where you want to add the keyframe.
- 2 Press Mark.



To adjust the timing of an existing keyframe:

- 1 Do any of the following:
 - Press In and then use the right dial to move the first keyframe.
 - Press Out and then use the right dial to move the last keyframe.

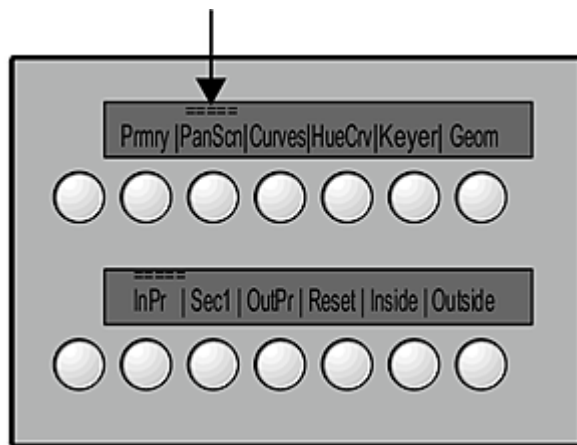


Repositioning Shots

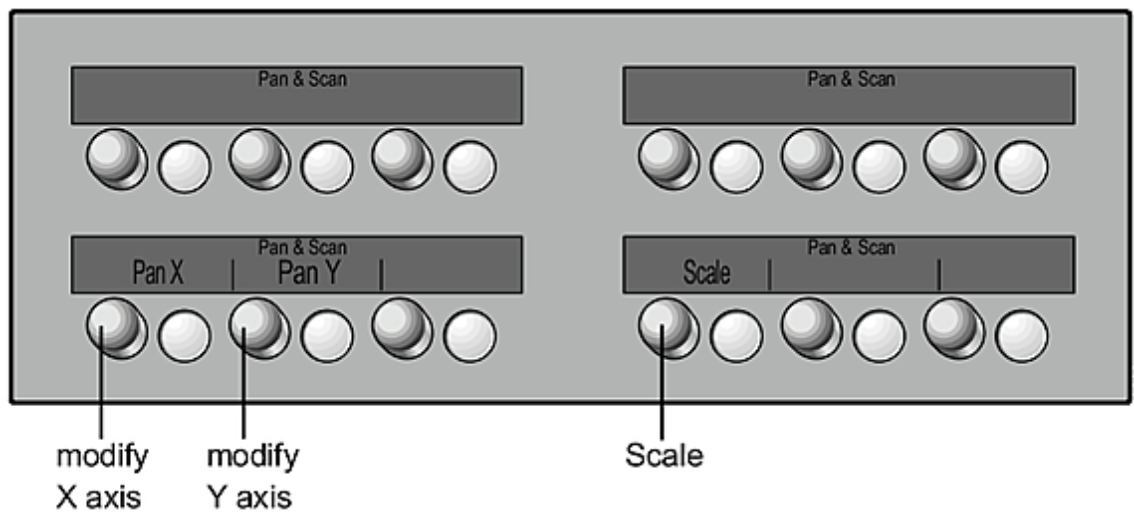
shots:repositioning with the Tangent CP100repositioning:shots with the Tangent CP100You can reposition a shot by scaling it, or by panning it vertically and horizontally.

To reposition a shot:

- 1 Enable PanScn.



- 2 Use the following controls to reposition the shot.



Primary Colour Grading

You can use the dials and trackballs in the centre of the control surface to perform primary colour grading. Primary colour grading can be done from the Grade menu.

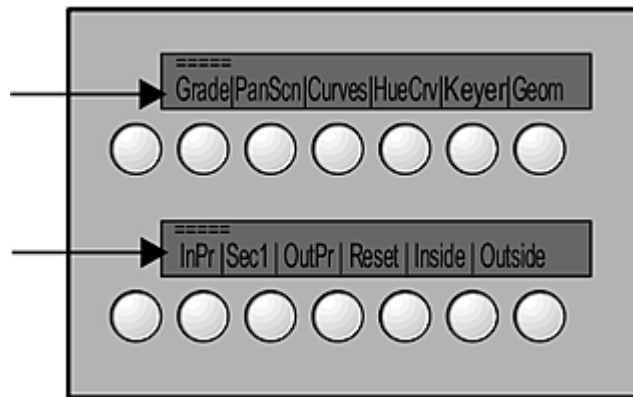
Logarithmic Mode: Modifying Brightness and Contrast

Logarithmic mode:grading with the Tangent CP100primary colour grading:in Logarithmic mode with the Tangent CP100You can modify brightness and contrast in several ways from the Grade menu. You can modify:

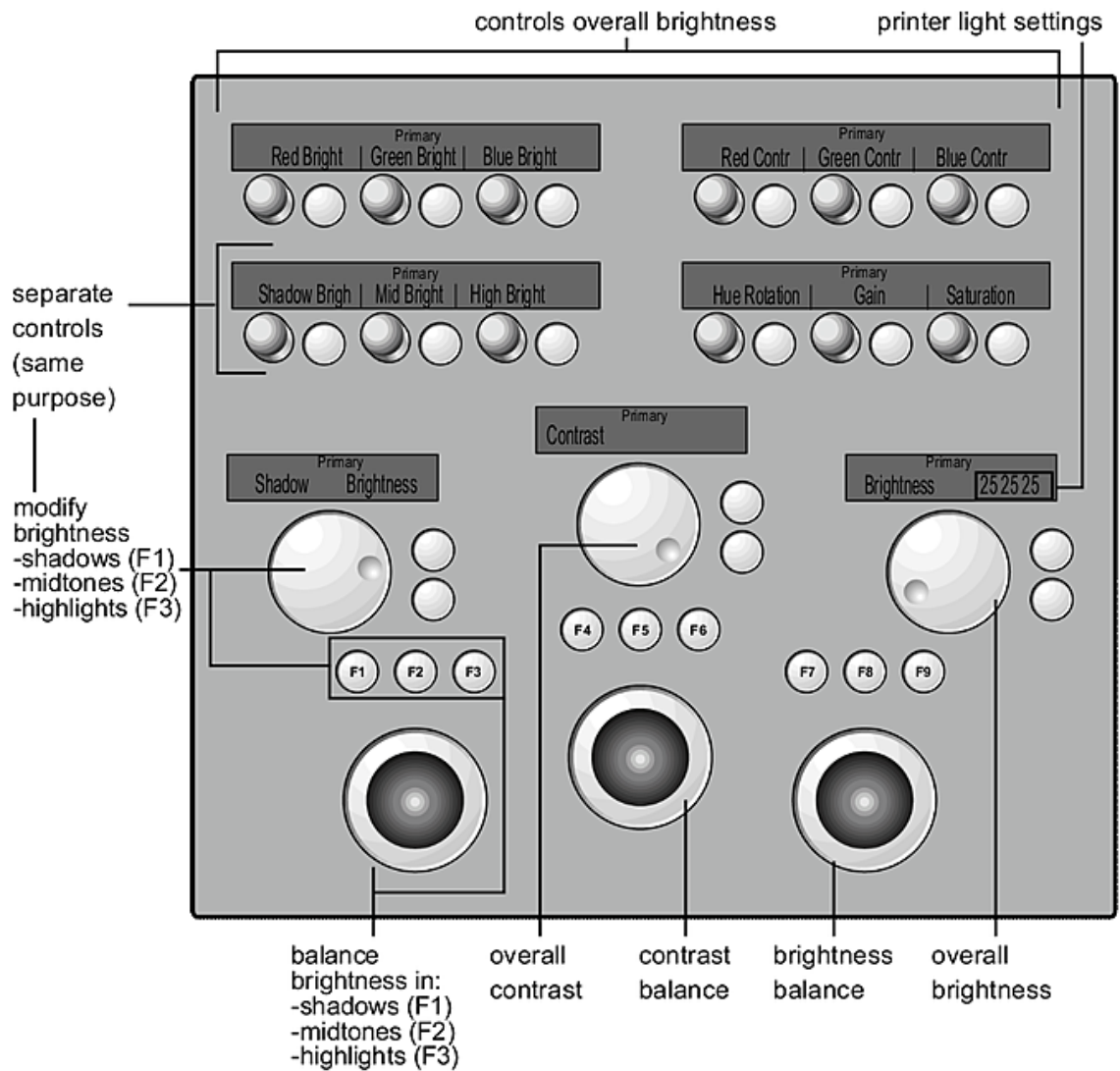
- Overall brightness and contrast of the red, green, and blue channels together.
- Overall brightness and contrast of the red, green, and blue channels separately.
- Brightness balance and contrast balance.
- Brightness in the shadows, midtones, and highlights.

To modify brightness and contrast:

- 1 Enable Grade and then do one of the following:
 - Enable InPr to modify the input primary values.
 - Enable OutPr to modify the output primary values.



- 2 Use the following controls to perform primary colour grading.



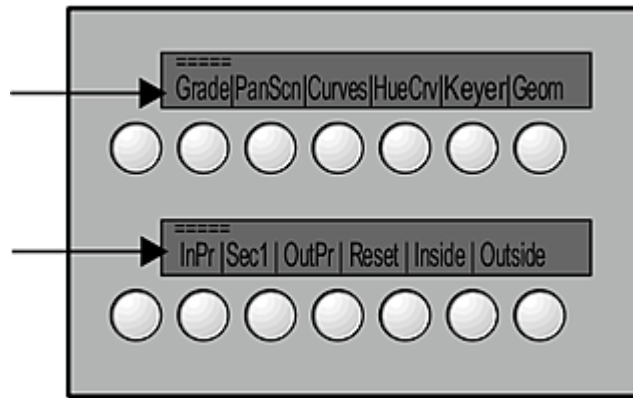
Linear Mode: Modifying Gamma, Gain, and Lift

Linear mode:grading with the Tangent CP100primary colour grading:in Linear mode with the Tangent CP100You can modify gamma, gain, and lift in several ways from the Grading menu. You can modify:

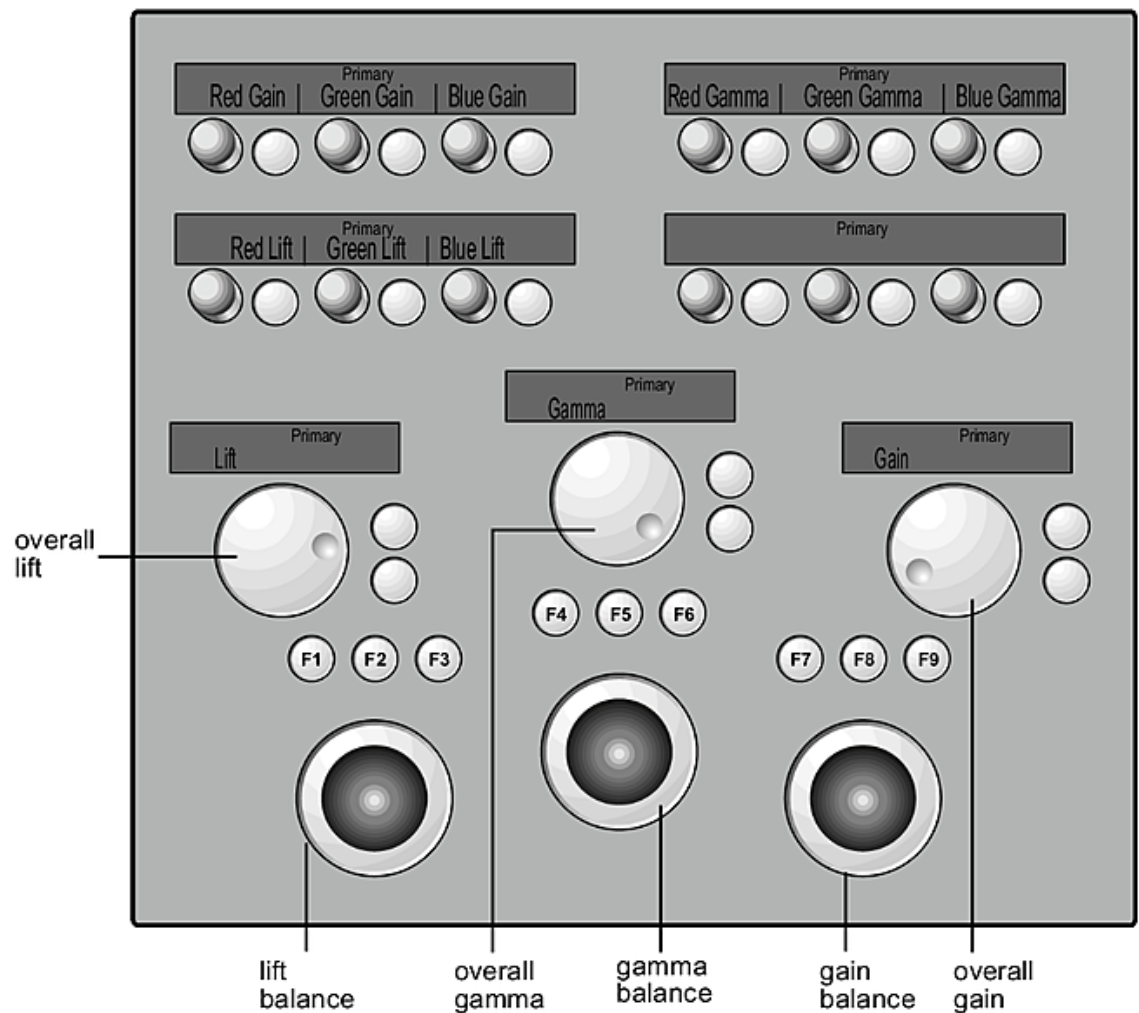
- Overall gamma, gain, and lift settings of the red, green, and blue channels together.
- Overall gamma, gain, and lift settings of the red, green, and blue channels separately.
- Gamma, gain, and lift balance settings.

To modify gamma, gain, and lift:

- 1 Enable Grade and then do one of the following:
 - Enable InPr to modify the input primary values.
 - Enable OutPr to modify the output primary values.



- 2 Use the following controls to perform primary colour grading.



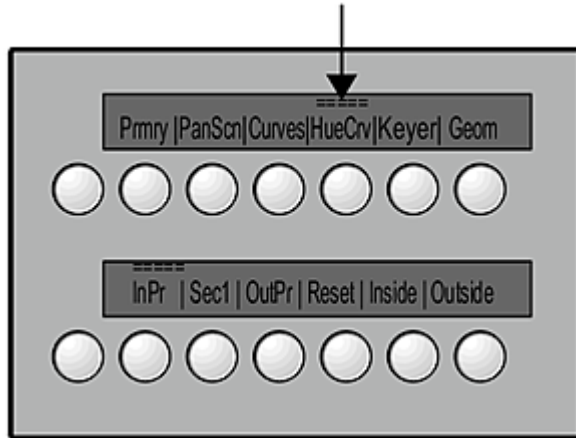
Modifying the Hue, Saturation, and Lightness Curves

colour grading:curves gradingcurves colour grading:with the Tangent CP100You can modify the hue, saturation, and lightness curves that appear in the Curves menu. You can modify the entire curve uniformly

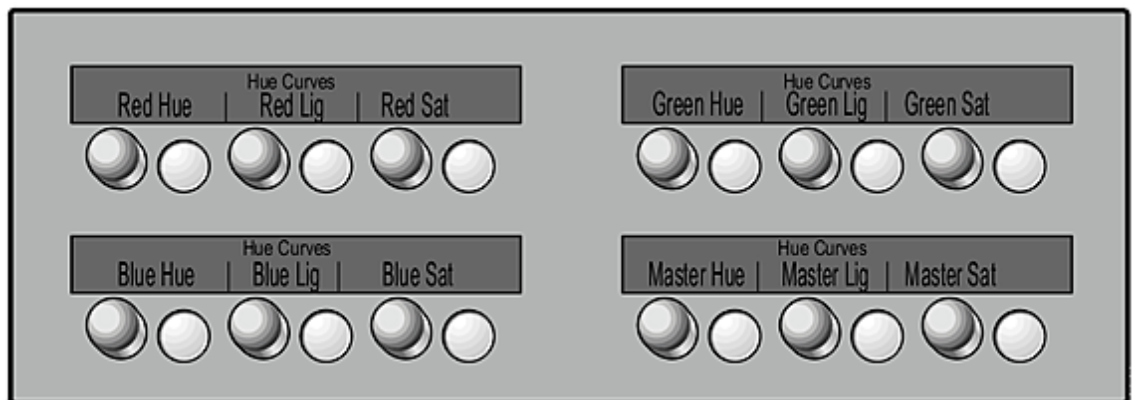
or modify individual vertices for RGBCMY channels (red, green, blue, cyan, magenta, and yellow). You must toggle between controls that modify the position of the red, green, and blue vertices and those that modify the position of the cyan, magenta, and yellow vertices.

To modify hue, saturation, and lightness curves:

- 1 Enable HueCrv to access controls for the red, green, and blue vertices.



- 2 Use the following controls to modify the hue, saturation, and lightness curve at each displayed vertex.



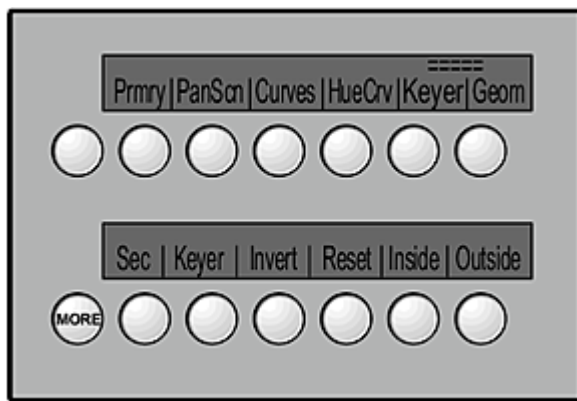
- 3 Press HueCrv again to access controls for the cyan, magenta, and yellow vertices, and then modify the curves.

Secondary Colour Grading

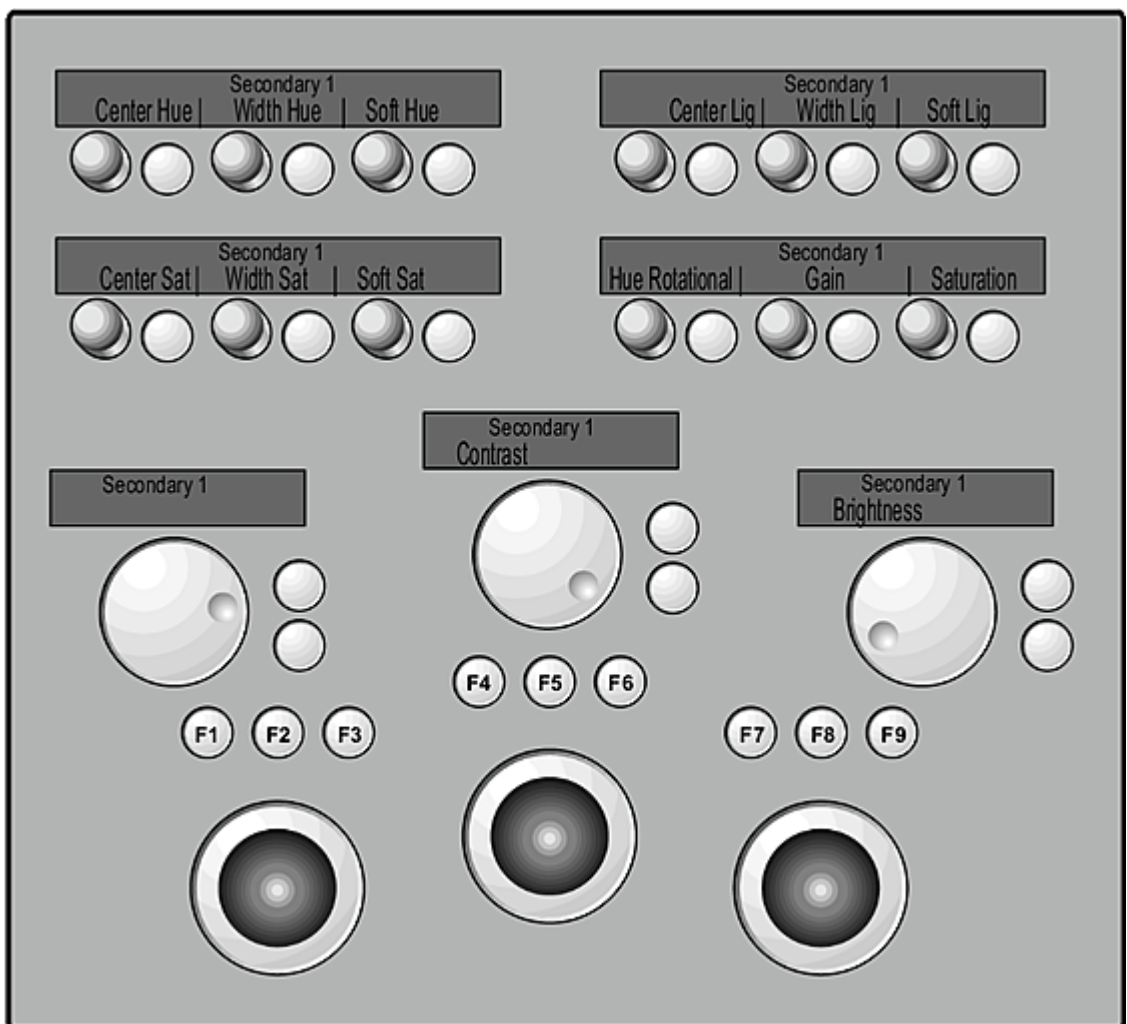
colour grading:secondaries with the Tangent CP100secondary colour grading:with the Tangent CP100You can colour grade up to eight secondaries from the control surface.

To access a secondary:

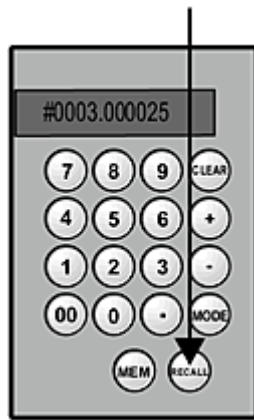
- 1 Enable Keyer.



The secondary controls for the first secondary appear. Once you enable and key a secondary, you can modify hue, gain, and saturation. You can also modify the brightness and contrast of the current secondary.



- 2 On the right side of the control surface, press Recall and then press a number between one and eight to go to that secondary. You can also press Selectv to toggle through the eight secondaries.

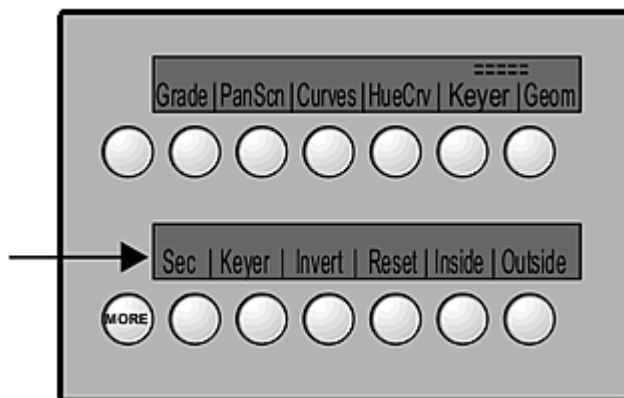


Applying Secondaries to the Shot

Use the second row of buttons on the left side of the control surface to set basic parameters for secondaries.

Press:	To:
Sec	Switch on and off the current secondary.
Keyer	Switch on and off the Keyer for the current secondary.
Invert	Invert the key for the current secondary.
Reset	Reset the key for the current secondary.

Enable the Sec button to apply the displayed secondary to the shot.



Creating Keys

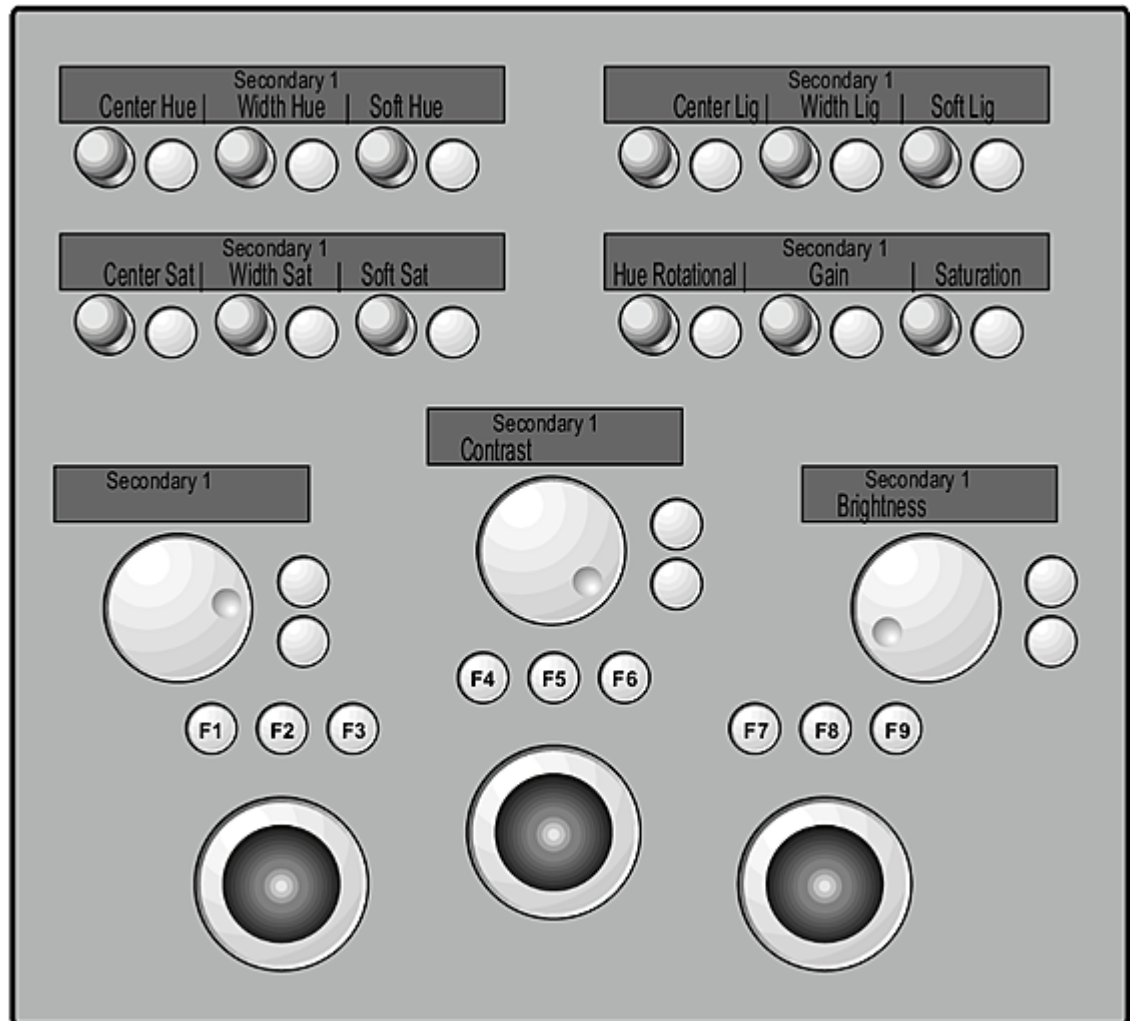
secondary colour grading:creating keys with the Tangent CP100keying:with the Tangent CP100Enable the Keyer button and then use the controls in the centre of the control surface to create a key.

To create a key:

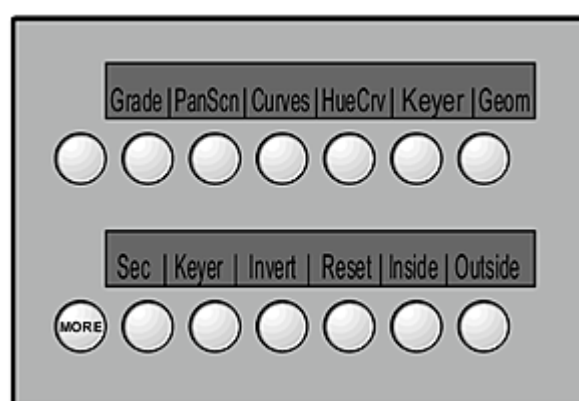
- 1 Enable Keyer in the upper control surface menu, and then enable Keyer in the lower menu.
- 2 To sample initial softness and tolerance, press F1 on the control surface and then use the left trackball to position the colour picker over the image. Press F1 again to sample the image.

NOTE Sampling from the control surface works slightly differently than sampling from the Lustre user interface. When you sample from the control surface, the value and saturation channels are set to the maximum softness. When you sample from the user interface, the value and saturation channels are not set to maximum values.

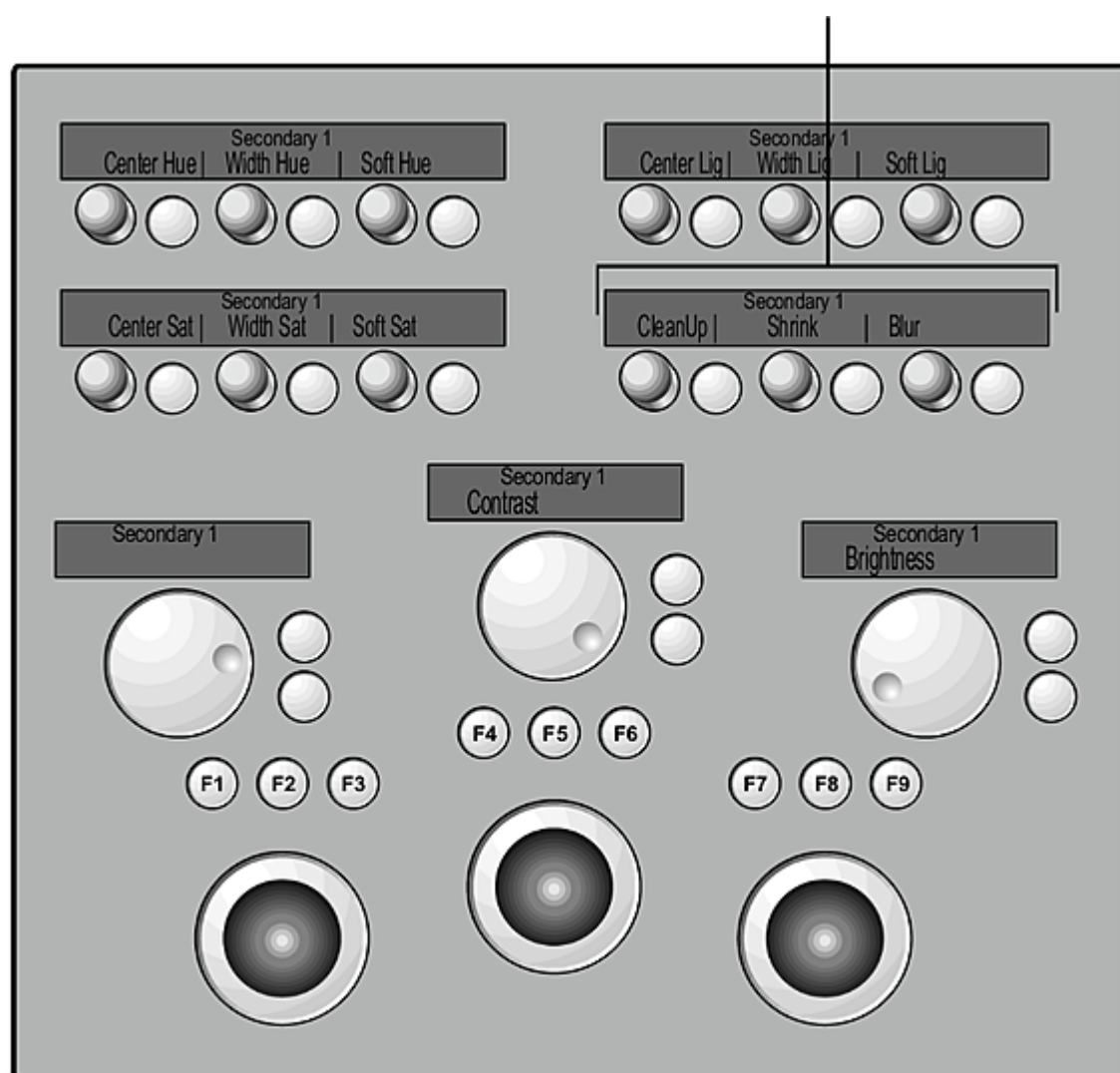
- 3 Set the hue, brightness/gain, and saturation levels for the key. Each value is modified according to the original sample—you can adjust the centre tolerance value, as well as the softness and tolerance ranges.



- 4 Press More (lower left) to shrink, blur, or clean up the edges of the key.



The Cleanup, Shrink, and Blur controls appear.

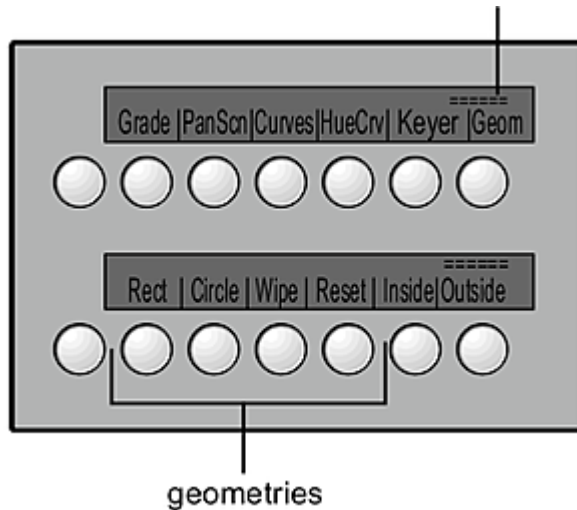


Creating Geometries

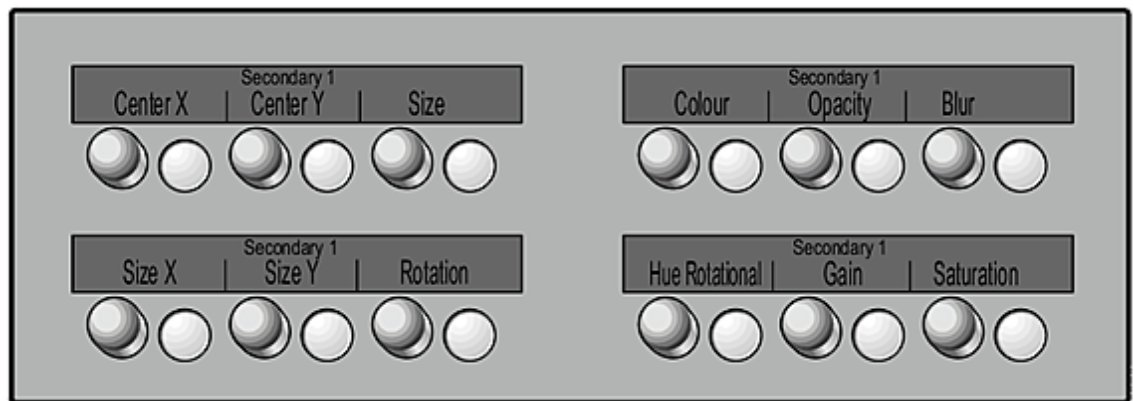
secondary colour grading:creating geometries with the Tangent CP100geometries:creating with the Tangent CP100You can create and apply basic and free-form geometries to each secondary.

To create a geometry:

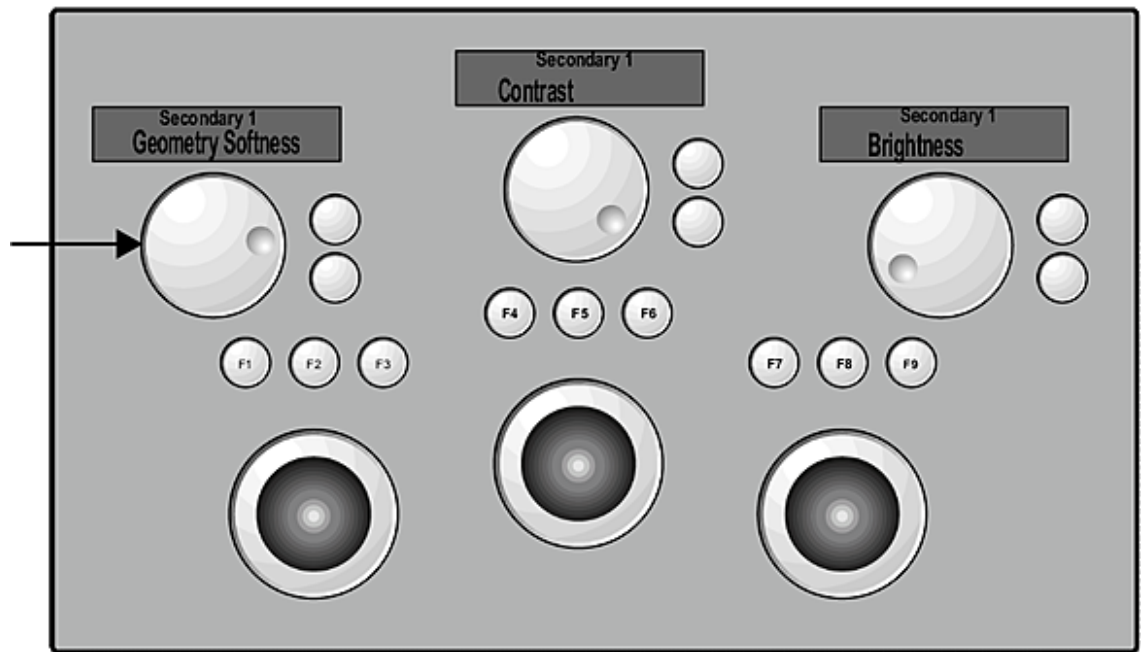
- 1 Enable Geom and then select the shape from the second row.



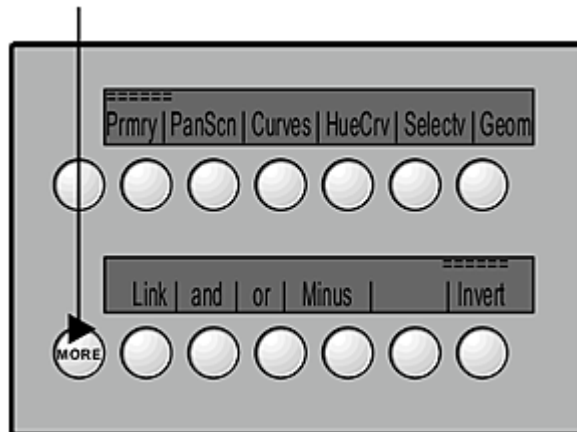
- 2 Use the controls in the centre of the control surface to modify the shape of the geometry, as well as its colour, opacity, and position on the image. You can also apply a blur.



- 3 To set softness, use the Geometry Softness dial.



- 4 To apply logical operations to the geometry, or invert the geometry, press the More button associated with the second row on the left.



Moving Geometries

You can move geometries from the control surface.

To move a geometry:

- 1 To select a geometry, press F1 on the control surface and then use the left trackball to position the cursor over the geometry. Press F1 again to select it. Alternatively, press F2 and F3 to move back and forth through the geometries (listed in the Axes list).
- 2 Use the left trackball to move the geometry.

